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CONTENTS

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IN THIS ISSUE

THE growing political importance of the Middle East has stimulated much interest in that area and in the conditions of life of its people. The January, 1949 issue of the *Quarterly* contained an article on population and wealth in Egypt, by Mr. Charles Issawi, a citizen of that country. In the present issue, Mr. Issawi and Mr. Carlos Dabezies present a paper, "Population Movements and Population Pressure in Jordan, Lebanon, and Syria." With a method which utilizes the concept of the "lot viable," the authors estimate the extent of population pressure in the three countries by relating the agricultural population to the agricultural resources. Both authors are affiliated with the United Nations' Division of Economic Stability and Development.

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A meaningful presentation of cases of chronic disease observed in a longitudinal study which extends beyond a twelve-month period requires a type of analysis which is different from that employed in past studies of morbidity.

The paper "Method of Statistical Analysis of Chronic Disease in a Longitudinal Study of Illness" by Jean Downes, presents a detailed description of the method of statistical treatment of data of chronic disease reported in the study of illness in the Eastern Health District of Baltimore. This paper will be of interest to those working in the field of morbidity studies since many now being initiated will be carried on over a period of years.

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Several studies in respiratory illness have shown that young

children have an incidence of illness considerably higher than do older children.

The article "The Risk of Attack of Respiratory Illness Among Parents of Children of Various Ages," by Jane E. Coulter and Doris Tucher, presents the results of an analysis designed to learn whether parents in family units with young children have a greater risk of illness from respiratory diseases than do those in families with no very young children.

It was found that the young children who have a high incidence of acute respiratory illness seem to present a greater risk of illness to their parents than do the older children.

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Although preferences as to sex of offspring may be a topic of perennial discussion among prospective parents, few objective studies of such preferences have been made. There have been even fewer studies of the relation of parental preferences as to sex of children to size of family. In this issue Jeanne E. Clare and Clyde V. Kiser present an article "Preferences for Children of Given Sex in Relation to Fertility." This is the fourteenth of a series of reports based upon the Indianapolis Study and appearing in the *Quarterly* under the general title "Social and Psychological Factors Affecting Fertility."

POPULATION MOVEMENTS AND POPULATION PRESSURE IN JORDAN, LEBANON, AND SYRIA

CHARLES ISSAWI AND CARLOS DABEZIES[1]

THE presence of three quarters of a million Arab refugees in the surrounding Arab countries lends particular interest to a study of population movements and population pressure in Jordan, Lebanon, and Syria. Very little data are, however, available on the subject. Published birth and death rates are misleading, and do not convey even an approximate idea of the magnitudes involved. In none of the three countries studied in this article has more than one census been taken, and in Jordan there has not been any census of population.

The figures in Table 1, are taken from available censuses and estimates. The estimated rates of increase may be compared with more reliable figures calculated for some of the neighboring countries in Table 2.

Although these figures involve a wide margin of error, the general picture of a rapid population growth which they give is undoubtedly correct. It may also be stated that this rate of growth is not likely to slacken in the next few years. For the general improvement in health conditions which has taken

Table 1. Population and rate of increase in Jordan, Lebanon, and Syria.[1]

COUNTRY	CENSUS OR ESTIMATE		RECENT ESTIMATE		ESTIMATED ANNUAL INCREASE (Per Cent)
	Year	Numbers (in 000's)	Year	Numbers (in 000's)	
Jordan			1948	400	—
Lebanon	1932 (Census)	855	1947	1,186	2.2
Syria[2]	1932 (Est.)	2,801	1947	3,340	1.2

[1] Sources : U. N. Statistical Office : Population and Vital Statistics Reports, 1949. S. B. Himadeh *Economic Organisation of Syria*, Beirut, 1936.
[2] Excluding Sanjak of Alexandretta from 1932 figure.

Country	Per Cent Annual Increase Between Two Last Censuses	Gross Reproduction Rate	Net Reproduction Rate
Cyprus	1.7	—	—
Egypt	1.8	3.11[1]	1.44[1]
Palestine ⎫	—	3.26[2]	1.80[2]
Moslems ⎭	—	4.76[2]	2.95[2]
Turkey	1.1	—	—

[1] Kiser, Clyde V.: The Demographic Position of Egypt, a paper in DEMO-GRAPHIC STUDIES OF SELECTED AREAS OF RAPID GROWTH. New York, The Milbank Memorial Fund, 1944, p. 119. (The figures refer to 1937.)
[2] Loftus, P. J.: FEATURES OF THE DEMOGRAPHY OF PALESTINE. Population Studies, Cambridge, 1948, II, No. 1, p. 92. (The first set of figures refers to 1931, the second to 1945.)

Table 2. Measures of growth in other countries of the Middle East.

place during the last thirty years, and which has recently been accelerated by the introduction of new weapons against diseases, is likely to bring down death rates, especially infant mortality rates. Birth rates, on the other hand, may remain at their present high level, since the economic and social structure of these countries tends to favor a high birth rate. The small decline in the birth rate of the Moslem population of Palestine in the interwar period, and the decrease in the proportion of children to women of child-bearing age in Egypt, may indicate that a slight decline in fertility has set in, but this will hardly be enough to offset the expected decline in death rates, and is most unlikely to exceed it. Perhaps the most important single factor bringing down the birth rate is the movement from the countryside into the towns, which has been taking place in most of the Middle Eastern countries during the last 20 years.

Emigration. Until the First World War, there was a relatively large scale emigration from Lebanon and Syria, averaging 15,000 per annum between 1900 and 1914.[2] This flow was directed at first to Egypt, and then to North and South Amer-

[2] Although no separate figures are available, it is certain that Lebanon accounts for at least half, and perhaps as much as two-thirds, of these totals.

ica. In the 1920's emigration to the United States was sharply curtailed, but this was compensated by increased emigration to South America and West Africa, the average for 1923–1926 being 14,000. During the depression period, however, further restrictions were imposed by the countries of immigration, and the annual outflow fell to 2,000 in 1931–1933, at which low level it remained until the end of the Second World War. Recently emigration has once more increased, amounting to 4,000–5,000 for Lebanon alone in 1950, but unless the present restrictions on immigration are lifted, emigration can absorb only a small part of the natural increase of the population of these countries.

Immigration. During the inter-war period, immigration into the region by far outweighed emigration. The principal influx was that of the Jews into Palestine, but several tens of thousands of Armenians and Assyrians, from Turkey, Iran and Iraq, settled in Lebanon and Syria. Many of the Armenians, however, left these countries for Soviet Armenia between 1945 and 1947. The recent fighting in Palestine has resulted in the displacement of about 750,000 Arabs, many of whom have found refuge in neighboring countries. Table 3 shows the number of refugees in each country and the proportion of refugees to the original population.

Table 3. Number and distribution of refugee Palestine Arabs, 1949.

COUNTRY	NUMBER OF REFUGEES	PERCENTAGE OF TOTAL	PERCENTAGE ADDITION TO ORIGINAL POPULATION
Northern Palestine	280,000	39	60
Gaza Strip	190,000	26	240
Lebanon	100,000	14	8
Syria	75,000	10	2
Jordan	70,000	10	17
Egypt	7,000[1]	1	—
Iraq	4,000	1	—
TOTAL	726,000	100	
Israel	31,000		

SOURCE: United Nations Economic Survey Mission for the Middle East: Final Report, 1949.
[1] These refugees have since been moved into the Gaza Strip.

AN ESTIMATE OF THE EXTENT OF THE
POPULATION PRESSURE

Owing to the predominance of agriculture in the national
economies of the Arab countries, the problem of population
pressure should be studied primarily as the relation between
the numbers of persons employed in agriculture and available
agricultural resources.[3]

Two main lines of inquiry are open. The first method in-
volves an estimate of the average income of farmers, which
is then compared with the levels prevailing in other regions
of the world, or with the levels that could conceivably be at-
tained in Arab countries by the optimum utilization of avail-
able natural resources.

The second method requires an estimate of the size of the
plot that can be worked by a farm family working full-time on
the farm with a minimum of hired labor, and using modern
tools in a reasonable measure, depending on the capital re-
sources of the country, the nature of the crops and the char-
acteristics of the soil. It is then possible to estimate the num-
ber of people who could be supported by the available land
under those conditions and compare them with the actual farm
population, in order to ascertain whether there is a deficiency
or a surplus of population. In the latter case it is also necessary
to inquire whether subsidiary farm occupations, such as live-
stock and poultry and temporary employment in non-agricul-
tural occupations, are adequate to maintain the standard of
living or whether the inadequate land resources result in "dis-
guised unemployment" and in low levels of living of the farmers.

The second method was applied in the present paper because
of the difficulties of estimating farm incomes, owing to inade-
quacy of statistical data. Estimates of the "lot viable" in

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[3] Throughout this paper it has been assumed that there is no excess population in
the towns and that the urban population is fully employed in industry, transport,
commerce and services. This assumption is not quite correct, since it is known that
there is considerable underemployment in the towns and some unemployment. Thus,
in the summer of 1950, it was estimated that there were some 40,000 unemployed in
Lebanon. In Egypt, unemployment has been estimated at 200,000–300,000.

Palestine before partition,[4] modified to take account of differences in agricultural yields among countries, were employed to calculate the size of the "lot viable" in Lebanon, Syria, and Jordan, care being taken to compute separate estimates for irrigated and non-irrigated land. Although the adjusted figures are very rough estimates, they do not seem out of line with what one would expect in the light of the known characteristics of the agricultural economies in these countries. Table 4 summarizes the results obtained.

The main conclusions that emerge from this table can be stated briefly:

In Lebanon there is a great congestion on the land. The number of families engaged in farming is about twice as high as that which the present cultivated area could adequately support. The situation is aggravated by the uneven distribution of landed property and the relatively high rents paid to absentee landlords. On the other hand, farmers derive a considerable additional income from tourist traffic, work in non-agricultural activities, and remittances from abroad.

Table 4. Actual number of farm families and estimated numbers that could be supported at an adequate level of living on cultivated and cultivable area in the three countries.

Country	Actual Farm Population (Families)	Number that Could Be Adequately Supported on Present Cultivated Area (Families)	Number that Could Be Adequately Supported on All Cultivable Area (Families)
Lebanon	120,000	68,000	100,000
Syria	340,000[a]	360,000	840,000
Jordan	37,000[b]	41,000	57,000

[a] If nomads are included this figure becomes about 390,000.
[b] Including semi-nomads, assumed to earn half their livelihood from agriculture. The total farming, semi-nomadic, and nomadic population, amounts to about 55,000 families.

[4] *See* Appendix 1 for a detailed description of the estimates and discussion of their limitations.

The bringing into cultivation of all cultivable lands and the irrigation of all irrigable lands would still not suffice to absorb all the present rural population. Moreover, although productivity can be considerably raised, it is unlikely to increase at a rapid rate in the immediate future.

Hence it may be safely stated that Lebanon must increasingly rely on non-agricultural activities to absorb its growing population.

In Syria the cultivated area is about sufficient to support the present farming population, but the very uneven distribution of landed property and the high level of rents paid to absentee landlords reduces by about two fifths the amount of income left in the hands of the farmers. Unlike Lebanese farmers, Syrian farmers cannot rely on any considerable addition to their incomes from non-agricultural sources. The result is that Syrian farmers subsist at a very low level of living.

The extension of irrigation and the bringing into cultivation of all cultivable lands would, however, make it possible for Syria to absorb a population about twice as large as the present combined farming and nomadic populations of the country.

The cultivated area of Jordan seems just about sufficient to maintain the present farming population, but here too high rents absorb a large proportion of the produce of the soil and depress the level of living. The extension of irrigation in the Jordan valley would bring under cultivation enough land to absorb all the nomadic and semi-nomadic population of that country.

It remains to add a few words about the Arab countries not covered in this article. Both Northern Palestine and the Gaza Strip are greatly congested and offer hardly any possibilities of resettlement. The Arabian Peninsula has, throughout history, been unable to maintain its population out of its own resources and has always been a center of emigration. The discovery and exploitation of oil, with all the benefits that it has conferred, has not fundamentally altered the situation.

Egypt has a large excess population, which is growing faster than the national income.[5] On the other hand Iraq offers enormous possibilities. Its fertile soil and abundant water, if properly used, can support a population far larger than the present 5,000,000. The irrigation and flood control works required for this purpose are not very expensive, relative to the areas to be brought under cultivation, and could be easily financed out of the country's rapidly increasing oil royalties. A loan of $12,800,000 from the International Bank for Reconstruction and Development is being applied for this purpose and it may be confidently stated that the country's economic future is hopeful.

APPENDIX I

THE "LOT VIABLE"—METHODS AND LIMITATIONS OF ESTIMATES

The Sustenance Area. It is evident that the area required to support a farmer and his family is the result of a number of natural, technical, economic and social factors. It varies according first, to region, climate and availability of water; secondly, to the methods of farming and to the extent that livestock can supplement the income derived from agriculture; and thirdly, according to the social and political structure of the countries, and more specifically the standard of living assumed, the extent of fragmentation of holdings, the relative prices received and paid out by farmers, the contributions required from farmers towards non-farm sectors, such as taxes or rent, or conversely, the availability to farmers of additional sources of income from employment in non-agricultural activities such as public works, or as in Lebanon, from remittances from relatives abroad.

Thus, no satisfactory definition in advance can be found on which it would be safe to base an estimate of the "lot viable" of the cultivator. This must be discovered by experience; by a system of trial and error in the different sections of each of the countries, taking into account the complex factors mentioned above.

The "Lot Viable" in Palestine. To the best of our knowledge, no reliable studies exist as to the subsistence areas in Arab countries, based on careful and realistic appraisal of the many variables men-

[5] Issawi, C.: Population and Wealth in Egypt, Milbank Memorial Fund *Quarterly*, January, 1949, xxvii, No. 1, pp. 98–113.

tioned in the opening paragraph of this section. On the other hand, the question has received careful attention in Palestine, both from the Mandatory Government and from Jewish economists.

The Survey of Palestine[1] summarizes a number of opinions on the question of the "lot viable." Sir John Hope-Simpson, reporting in 1930, made the most careful analysis of this question and concluded that the "lot viable" is no less than 13 hectares[2] on unirrigated land, unless considerable capital enabled the tenant to maintain a dairy herd of foreign or cross-breed animals, in which case in the richer tracts the holding may be possibly, but questionably, reduced to 10 hectares. Where irrigation is available and when dairying is possible, the holding may be reduced to 4 hectares, of which 2 are irrigated. When plantations of citrus and bananas are established the "lot viable" may be placed at 1.5 to 2.0 hectares.

The reasoning underlying these estimates must be clearly pointed out. The "lot viable" was assumed to be an area of average fertility, to be cultivated by Arab farmers employing modern agricultural methods. Whenever possible farmers would use modern implements on a co-operative basis, or would hire them for basic agricultural operations. As to labor, it was posited that farmers would use outside labor only at peak periods of harvesting, but would otherwise furnish, together with other members of their families, all the labor required.

Under these assumptions, the net income of the family would be in the neighborhood of £P 100 per year (or about $480), at pre-war prices, which may be taken as sufficient to maintain a reasonable standard of living in relation to the social and economic conditions then prevailing in Palestine, and without any additional income from outside. But it should be pointed out that taxes, rent, and interest have not been deducted, nor has supplementary income been added.

Although the sustenance area of unirrigated land was estimated at 10 hectares under optimistic conditions, it seems preferable to use figures nearer the upper limit given by Sir John Hope-Simpson, in order to approximate average conditions in Arab Palestine. Therefore, in what follows the size of the sustenance area in that country is assumed to be 12 hectares for unirrigated land and 2.5 hectares for irrigated land.

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[1] A Survey of Palestine. Prepared by the Government of Palestine for the Anglo-American Committee of Inquiry, Jerusalem 1946, Vol. ii, p. 272–289.
[2] One hectare is equal to 2.471 acres.

The "Lot Viable" in Arab Countries. In the absence of comparable studies for Arab countries, the results for Palestine were adjusted by means of weighted averages of indices of agricultural yields in Lebanon and Syria, as a percentage of yields in Palestine. Averages of yields in several consecutive years were used to approximate the "typical yields" for each country's produce. The following products were selected as representative of each group:

Unirrigated fruits: olives and grapes

Winter cereals: wheat and barley

Winter legumes and vegetables: lentils and "kersenneh"

Summer crops: melons and tomatoes

Irrigated produce: tomatoes, bananas, onions, garlic, and cucumbers

Two different systems of weights were used to derive average yields: first, the values of each group of crops in Palestine in 1943 and 1944; secondly, the schedules of production in two representative Arab farms in Palestine.

The estimates give in the first instance index numbers of physical production for a given area. These in turn were used to derive index numbers of the area of land necessary to maintain a given level of production. Separate computations were made for irrigated and non-irrigated land. The final results are shown in the following table:

Unirrigated Land	Index Number of the Area of the "Lot Viable"			Estimated Area of the "Lot Viable" (Hectares)		
	Palestine	Lebanon	Syria	Palestine	Lebanon	Syria
First Weighting System	100	58	71			
Second Weighting System	100	60	71	12.0	7.0	8.5
Irrigated Land[1]	100	60	110	2.5	1.5	2.5

[1] Based on first system only.

Data on Jordan being insufficient even for a rough approximation, it has been assumed that the lot viable in that country is equal to that of Palestine, i.e. 12 hectares of unirrigated land and 2.5 of irrigated.

Comments. It should be plain from the preceding sections that the figures of the "lot viable" shown above are only very rough estimates of the magnitude of the variable, without any attempt at precision.

It is recognized that any computation based on countrywide averages is apt to be misleading, and that objections to the basic assumptions, as well as to the statistical techniques, may be raised.

1. Insofar as countrywide yields were used as an indicator, it may be assumed that they reflect differences in soil fertility, rainfall, and methods of cultivation. They are, however, subject to uncertainty because of the unreliability of the estimates of area and production from which yields were derived. Reliability also varies between crops and between countries: it is probably greatest for cereals and smallest for orchard crops. But yields are also affected by the proportion of irrigated land and the proportion of each crop that is grown under irrigation. As to the proportion of irrigated land, it happens that there is little spread between the percentages for Palestine, Lebanon, and Syria. The rough-and-ready assumption that certain crops are wholly grown on unirrigated land and certain others wholly grown on irrigated land is valid only as a first approximation. Most garden vegetables and potatoes may be, and are in fact, grown on either type of land. Differences in the degree of irrigation of each crop among countries certainly exist and average yields thus become more misleading.

2. The systems of weighting can be defended on purely empirical grounds as showing comparable results. Each of them, however, may be objected to on theoretical grounds.

3. The Palestine estimates of the "lot viable" are again open to criticism on many grounds. They are optimistic as they assume a net return to the average farmer far beyond that which he can expect in actual practice. An investigation made in five Arab villages in Palestine in 1944 (SURVEY OF PALESTINE, Vol. 3, p. 1,208) shows that the size of the average lot was 6.3 hectares per family (not consolidated) and the return therefrom only £P 105 at 1944 prices, which would be equivalent to some £P 33 to 40 (about $150) at pre-war prices, out of which rent, taxes, and interest were paid, as well as wages to hired labor at harvest time. This latter figure should be compared with the net income of £P 100 at pre-war prices which resulted from the estimates of the "lot viable." Thus, agricultural pursuits alone cannot support the average farm family at anything like an adequate level of living under the existing social and economic conditions.

4. It is obvious that a realistic appraisal of living conditions of

farm life must take into account the income accruing from such oc-
cupations as livestock and poultry, from employment in non-agricul-
tural occupations, as well as the costs of taxes and rent.

Estimates of these magnitudes are unfortunately even less reliable
than those for agriculture proper. However, in the five Arab villages
in Palestine referred to above, the farmers received only 62 per cent
of their incomes from agriculture proper; 18 per cent from livestock
and poultry; and the remaining 20 per cent from non-agricultural
sources.

Some indications are given in the country appendices of the order
of magnitude of the variables in the several Arab countries based on
the opinions of persons familiar with economic and social conditions
in the area.

APPENDIX II

DATA AND ESTIMATES FOR LEBANON

No recent official breakdown of the population of Lebanon into
rural and urban is available, but in 1932 about one-third of the pop-
ulation lived in towns with over 10,000 inhabitants. This proportion
has increased somewhat since that date, and it may be assumed that
at least 40 per cent of the total population is now urban. Another
10 per cent of the population, although living in the larger villages,
is not directly engaged in agriculture. This leaves a farming popu-
lation of just over 600,000.

Assuming that the average Lebanese peasant family consists of
5 persons, the number of farming families is 120,000.

The total cultivated area of Lebanon is 280,000 hectares. It has
been estimated that this could be increased to 395,000 hectares,[1] but
this estimate seems very optimistic since the only land at present un-
cultivated consists either of rocky mountain slopes or regions of low
rainfall in the plains. Of this total, 53,000 hectares are irrigated.
The projects at present under way, or for which the necessary pre-
liminary plans have been made, will raise this figure to 80,000 hectares.
It has been estimated that the total irrigable area is 124,000 hectares.[2]

It has been assumed that the "lot viable" for a family of peasant

[1] *See* Appendix Table A.
[2] Sir Alexander Gibb: Report on the Economic Development of Lebanon.

proprieters is 7 hectares of unirrigated land, and 1.5 hectares of irrigated land.[3]

The number of families that could be adequately supported on the present cultivated area is therefore:

Non-Irrigated Area	33,000
Irrigated Area	35,000
Total	68,000

The completion of the irrigation works now in hand would raise the total number of families that could be supported on irrigated land to over 50,000.

The bringing into cultivation of all cultivable land and the irrigation of all irrigable land would change these figures as follows:

Non-Irrigated Area	20,000	Families
Irrigated Area	80,000	Families
Total	100,000	Families

Needless to say, the cost of the irrigation works required to irrigate 124,000 hectares would be very considerable. Similarly much capital investment would be necessary for the terracing and other work required to bring the uncultivated rainfed zones into cultivation.

The following explanations and qualifications are necessary:

1. *Size of Farm Population.* The assumption that about 15 per cent of the rural population is engaged in occupations other than farming is based on the opinion of well-informed students of Lebanese village life.

2. *Size of Family.* The size of the average Palestinian family is just over 6. In Lebanon, however, a figure of 5 is nearer the truth, first because, on the whole, Lebanese families are smaller than Palestinian; and secondly, because the relatively large-scale emigration from Lebanon reduces the average size of the family living on the farm.

3. *Lot Viable.* The figures adopted (7 hectares of unirrigated land and 1.5 hectares of irrigated) represent an absolute minimum, since they are based on conditions in Arab Palestine, which were appreciably worse than those in Lebanon.

[3] *See* Appendix Tables B and C.

4. *Livestock.* Sir John Hope-Simpson's estimate of the "lot viable" assumed that the farmer was able to maintain a dairy herd. The number of livestock in Lebanon is somewhat smaller, in relation to the total population, than that of the Arab section of Palestine. Relative to the *farming* population, however, the difference is not very great.

5. *Income from Non-Agricultural Activities.* This is derived from three main sources:
    a. Tourist trade;
    b. Seasonal or occasional work in industry or public works;
    c. Remittances from emigrants.
The first item must be excluded in this study, since it has already been allowed for by the deduction of 15 per cent of the rural population (*see* Note 1, above). It is however probable that the tourist traffic does indirectly increase farmers' incomes. The amount derived from the other two items combined may represent an addition to the farm income of 40 to 50 per cent. For purposes of comparison, it is worth noting that in the Arab sector of Palestine income from non-farming activities (excluding remittances) represented 20 per cent of farm income in 1944.[4]

6. *Rents Paid to Landlords.* Almost half the total area of Lebanon, including some of the richest agricultural land in the country, is owned by a few large landlords. The share of the net produce accruing to the landlord can be put at a minimum of 50 per cent. This means that at most 75–80 per cent of the net produce of agriculture remains in the hands of the farmers. The deduction which should be made to take account of this item however does not offset the addition made under note 5, above.

7. *Increase in Productivity.* There is undoubtedly much room for an increase in productivity, since yields in Lebanon are relatively low. This is partly due to natural conditions, such as the irregularity of the rainfall and the stony and shallow nature of much of the soil. It is also partly due, however, to the inefficiency of the techniques used. If productivity can keep pace with population, i.e. increase at an annual rate of about 1.5 per cent, a remarkable result will have been obtained. In other words, an increase in productivity cannot by itself be relied upon to solve the population pressure.

The conclusion to be drawn is that the figures calculated above represent the *maximum* possible number of farmers who can live on the land; and that even if all the irrigable land in Lebanon is brought under irrigation there will remain a relatively large surplus of rural population.

[4] SURVEY OF PALESTINE, Vol. III, p. 1208.

APPENDIX III

DATA AND ESTIMATES FOR SYRIA

The most recent estimate of the Syrian population puts the urban population at 1,003,000, and the rural population at 2,041,000. There are also some 300,000 nomads. The latter should be left out of any calculations regarding the present congestion on the land, since their flocks graze on lands which are not at present cultivated.[1] The extension of the cultivated area would, however, encroach on much grazing land; hence the nomads should be included in any study of Syria's long-term absorption capacity.

Assuming that the average Syrian peasant family consists of 6 persons, the number of rural families is 340,000. The inclusion of the nomads raises this figure to 390,000.

The total cultivated area of Syria is about 2,314,000 hectares.[2]. The total cultivable area is put at 5,680,000 hectares[3] but this figure is probably too high. Of the cultivated land, about 297,000 hectares are irrigated, and it is estimated that the minimum total irrigable area is about 600,000 hectares.[4]

It has been assumed that the "lot viable" for a family of peasant proprietors is 8.5 hectares of unirrigated land, and 2.5 hectares of irrigated land.[5]

The number of families that could be adequately supported on the present cultivated area is therefore:

Non-Irrigated Area	241,000
Irrigated Area	119,000
Total	360,000

The bringing into cultivation of all the land at present uncultivated and the irrigation of all irrigable land would change these figures as follows:

Non-Irrigated Areas	600,000	Families
Irrigated Areas	240,000	Families
Total	840,000	Families

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[1] Insofar as some of the semi-nomads practice cultivation, however, they use a certain amount of agricultural land.
[2] Al Majmua al Ihsaia al Suria 1948.
[3] *Ibid.*
[4] Sir Alexander Gibb: Report on the Economic Development of Syria.
[5] *See* Appendix Tables B and C.

As for Lebanon, the extension of cultivation, both in irrigated and unirrigated areas, requires a large capital expenditure and irrigation works and agricultural machinery.

The following explanations and qualifications are necessary:

1. *Size of Farm Population.* It has been assumed that all the rural population is engaged in farming.

2. *Size of Family.* It has been assumed that the average Syrian family is about the same size as the average Palestinian, i.e. 6.

3. *Lot Viable.* The figures adopted (8.5 hectares of unirrigated land and 2.5 hectares of irrigated) are based on the Palestinian standard of living, which was somewhat higher than the Syrian.

4. *Livestock.* The livestock population of Syria is larger, in relation to the total population, than that of the Arab section of Palestine. A large proportion of the animals, however, belong to the nomads and hence do not affect the economy of the farming population.

5. *Income from Non-Agricultural Activities.* In Syria this is negligible, and probably represents a maximum addition of 5 to 10 per cent to the farmers' incomes.

6. *Rents Paid to Landlords.* An even larger deduction must be made under this heading than in Lebanon. The following figures on the distribution of land are available:

	Under 10 Hectares	*10–100 Hectares*	*Over 100 Hectares*	*State Owned*
Total Area Owned	1,158,000	2,626,000	2,313,000	1,816,000
Percentage of Total	15	33	29	23

Insofar as the State lands are cultivated, they are mainly farmed by large landlords. Assuming, therefore, that half the lands lying in the 10–100 hectare category are cultivated by their owners and the rest by tenants, it is probable that rent is paid on about two-thirds of the land of Syria. Rents average about 60 per cent of the produce. In other words, only about 60 per cent of the total produce remains in the hands of the rural population.

7. *Increase in Productivity.* There is even more scope for an

increase in productivity in Syrian agriculture than in Lebanon, for natural conditions, are, in general, more favorable and technical methods less advanced. Here too, however, it may be taken that the increase in productivity is not likely to outstrip the growth in population and that such an increase cannot be relied upon to absorb any excess rural population.

The conclusion to be drawn is that the present cultivated area of Syria would suffice for its present rural population if the latter retained all the produce of the land. As has been seen, however, about two fifths of the produce is taken by city-dwelling landlords.

The cultivable area of Syria is, however, sufficient to absorb a large increase in population.

APPENDIX IV

DATA AND ESTIMATES FOR JORDAN

Figures regarding the population of Jordan are very scanty, but a total of 400,000 is generally admitted. It has been estimated that about 70,000 persons live in the towns (Amman, Irbid, Salt, and Kerak). Of the remaining 330,000, it has been assumed that 150,000 are settled; 140,000 are semi-nomads and 40,000 are nomads. It has also been assumed that the semi-nomads derive half their income from agriculture, and therefore need half as much land as the settled population.

Assuming an average family of 6, the total number of families engaged in agriculture would be:

Settled	25,000 Families
Semi-nomad	12,000 Families
Total	37,000 Families

It has been assumed that the "lot viable" for a family of peasant proprietors is similar to that of Palestine, i.e. 12 hectares of unirrigated land, and 2.5 hectares of irrigated. The total cultivated area of Jordan is put at 400,000 hectares, of which 26,000 are irrigated.[1]

[1] Warriner, Doreen: LAND AND POVERTY IN THE MIDDLE EAST. Oxford University Press, 1948.

The total number of families that could be adequately supported is, therefore:

Non-Irrigated	31,000 Families
Irrigated	10,000 Families
Total	41,000 Families

The total cultivable area is put at 450,000 hectares.[2] The additional area which could be brought under irrigation is estimated at 37,000 hectares.

The total number of families that could be adequately supported in Jordan is, therefore:

Non-Irrigated	32,000 Families
Irrigated	25,000 Families
Total	57,000 Families

No figures are available regarding the distribution of landholdings, hence no attempt has been made to compute the percentage of total farm income which is absorbed by rent, but it is very unlikely that this is below 25 per cent.

No great adjustment seems to be necessary under the heading of income from livestock, since, as in Syria, most of this belongs to the nomads. Income from non-agricultural occupations, however, is relatively high. It consists of the pay of the Arab Legionnaires and income from work on road making and other public works.

The conclusion to be drawn is that the cultivated area in Jordan is sufficient to support the present farming population. The execution of irrigation schemes in the Jordan would make room for an additional 20,000 families, or about 120,000 persons. This would be just sufficient to enable the nomads and semi-nomads to settle down to agricultural life.

[2] Ionides, M. G.: Jordan Valley Irrigation in Transjordan: *Engineering*, September 13, 1946, London.

Appendix Table A. Cultivated and cultivable areas of Jordan, Lebanon, and Syria. (Thousand hectares.)

COUNTRY	YEAR	CULTIVATED			CULTI-VABLE	GRAND TOTAL
		Non-irrigated	Irrigated	Total		
Jordan	1938[1]	214	26	440	—	—
	1946[2]	174	26	400	50	450
Lebanon	1942[3]	—	—	176	—	—
	1943[3]	—	—	169	—	—
	1946[4]	195	30	225	180[4]	405
	1947[5]	186	44	230	30	260
	1948[6]	195	44	239	200	439
	1948[7]	227	53	280	115	395
Syria	1942[3]	—	—	1,495	—	—
	1943[3]	—	—	1,487	—	—
	1945[8]	1,969	237b	2,205e	—	—
	1946[4]	2,006	284	2,290	3,360	5,650
	1947[9]	2,017	297	2,314	3,366	5,680

a Described as follows : "The bringing into cultivation of these lands would be very expensive."
b Could be increased to 600,000 hectares.
c Includes about 700,000 hectares fallow.
[1] Palestine Partition Commission Report.
[2] Warriner, Doren : Land and Poverty in the Middle East ; Ionides, M. G. : Jordan Valley Irrigation in Transjordan.
[3] Recueil de Statistique de la Syrie et du Liban 1942–3.
[4] Recueil de Statistique de la Syrie et du Liban 1945–7.
[5] Sir Alexander Gibb : Report on the Economic Development of Lebanon.
[6] Republique Libanaise : Recueil des Statistiques Generales 1947–8.
[7] Government estimate.
[8] Sir Alexander Gibb : Report on the Economic Development of Syria.
[9] Al Majmua al Ihsaia al Suria 1948.

Appendix Table B. Crop yields in three middle east countries.

CROP	AVERAGE YIELDS IN QUINTALS PER HECTARE 1942–1945			AVERAGE VALUE OF CROP IN PALESTINE IN 1943 AND 1944 (£P 000,000)
	Palestine	Lebanon	Syria	
Cereals	1	1.33	1.8	
Wheat	4.3	6.3	7.4	16
Barley	4.6	5.8	8.5	9
Kersenneh	5.1	8.7	6.4	2
Lentils	4.4	8.8	4.9	2
Fruits				
Olives	9.6	24.9	9.8	23
Grapes	27.6	43.5	46.8	16
Melons	92.9	71.6	78.9	8
Bananas	105.0	109.5		6
Others				
Tomatoes	79.8	184.3	56.2	19
Cucumbers	80.6	148.7	115.2	5
Potatoes	123.5	71.2	45.6	20

SOURCE : F.A.O. Yearbook of Food and Agricultural Statistics.

Appendix Table C. Livestock population in four middle eastern countries.[1] (In thousands.)

	PALESTINE (1943)a	LEBANON (1946)	SYRIA (1946)	JORDAN (1947)
Cattle	219	24	376	60
Sheep	225	21	3,260	238
Goats	315	500	1,257	304
Camels	33	2	47	2
Horses	17	8	110	6
Mules	7	6	49	3
Donkeys	105	26	232	25
Pigs	12	1	—	—
TOTAL	933	588	5,331	638
Poultry				385

[1] Including nomad-owned livestock.
a Arab-owned.
SOURCE: FAO Yearbook of Food and Agricultural Statistics.

METHOD OF STATISTICAL ANALYSIS OF CHRONIC DISEASE IN A LONGITUDINAL STUDY OF ILLNESS

JEAN DOWNES[1]

THE purpose of this paper is to present a detailed description of the method employed in the statistical treatment and presentation of data of chronic disease reported in the study of illness in the Eastern Health District of Baltimore (1).

White families living in thirty-four city blocks formed the sample population. The plan of the study was to follow families that lived in a group of houses in certain blocks rather than to follow a selected group of families. No attempt was made to continue visiting families which moved out of these houses during the period of the study, but the new families that moved into the houses vacated in the sample blocks were included in the study. The record of illness started with the first visit to the family and each family was visited once a month thereafter.

In seventeen of the thirty-four city blocks the families were visited over a period of five years; in the other seventeen, visiting was continued for three years. The data include illness in families observed two months or longer. Hence the shortest possible period of observation was two months and the longest was from three to five years. This fact must be kept in mind when considering chronic conditions present in the population, since these illnesses have a relatively long duration.

A meaningful presentation of cases of chronic disease observed in a longitudinal study such as this, which extends beyond a twelve-month period, requires a type of analysis which is different from that employed in past studies of morbidity.

Briefly, the problem is this: When a population of families is first surveyed for illness, the chronic diseases usually form the major proportion of the total illnesses present at that time. In the study of illness in the Eastern Health District of Baltimore,

from 60 to 70 per cent of the total illnesses reported as present in the family at the time of the first visit were those of a chronic nature. These were all conditions which had their onset prior to observation of the family and cannot properly be considered as incidence of illness within the period of observation. In a population observed over a period of time, illnesses of a chronic nature have a low incidence, that is, occurrence of newly-diagnosed cases, in comparison with their prevalence at any given time during the period. For example, in the population observed in the Eastern Health District, the annual incidence of new diagnoses of major chronic illness was 23.6 per 1,000 person-years compared with a prevalence of 178 per 1,000 person-years. It is apparent that if prevalence in each year of observation is not considered, incidence of new cases alone will not reveal the true state of the population with respect to the presence of chronic disease.

This problem was encountered in the earliest longitudinal study, namely, the Hagerstown study which was initiated and conducted by Edgar Sydenstricker (2). This study included observation of families over a period of twenty-eight months. In the first published paper from the study it is evident that Sydenstricker realized that a morbidity rate of a specific chronic illness based upon "years of life exposed" over a twenty-eight-month period did not give a true picture of that particular chronic disease in the population studied. Consequently, he presented a table (Table 4 in his text) which shows the prevalence of chronic illness in the population of the 8,587 persons in the Hagerstown study instead of using for a population base the years of life exposed which numbered 16,517. The effect of this procedure upon the chronic illness rates is readily apparent. For example, morbidity from heart disease in Table 2 of Sydenstricker's text was 10.1 per 1,000 when based upon years of life exposed and 21.2 per 1,000 when based upon persons. In this paper, he gave a definite clue as to how morbidity from chronic disease could best be treated in the longitudinal study which extends beyond a twelve-month period.

The morbidity study made by the Committee for the Cost of Medical Care and reported upon by Collins (3) indicated that a relatively high proportion, 44 per cent, of certain of the chronic illnesses noted had their onset prior to observation of the population studied.[2] All cases of illness which had their onset prior to observation of the population were included in the annual attack rate but the data were shown in such a way that prevalence of illness could be distinguished from incidence of attacks of illness. Since this study was limited to twelve months, the problem of how to count chronic illnesses present in the population in successive years did not arise.

CHRONIC DISEASE IN THE EASTERN HEALTH DISTRICT OF BALTIMORE

The problem of obtaining an accurate and complete picture of the extent of chronic disease in an observed population was of particular concern in the study in the Eastern Health District. Careful inquiry was made concerning members of the family who were in institutions for the mentally ill, for the feeble-minded, for the tuberculous, and for other chronic diseases requiring institutional care. The instructions for the use of the family visitors contained a list of the more common chronic diseases about which inquiry was to be made.

Special information was sought for all diseases of a chronic nature. This special information included data concerning the onset of the first symptoms of the disease, their nature and date, the date first diagnosed, and whether or not the diagnosis was made by a private physician, at a clinic, or at a hospital. Illnesses that were reported as chronic were asked about on each subsequent visit to the family. Inquiry was made concerning the amount of discomfort or disability suffered from the condition since the last visit and the amount and nature of medical care received for it.

CODING OF CHRONIC DISEASE

It is of interest at this point to explain how the data of

[2] These chronic illnesses include cancer, rheumatism, diabetes, epilepsy, chorea, heart disease, varicose veins, high blood pressure, peptic ulcer, tuberculosis, and syphilis.

chronic disease were coded and the purposes of the coding.

Editing. Careful editing of the illness records was a prerequisite to their coding. Editing was necessary for two reasons: (1) to distinguish chronic illness from nonchronic illnesses which had the same name or diagnosis; and (2) to avoid consideration of symptoms of a chronic disease as though each symptom were a distinct disease entity.[3] It is appropriate to cite examples under each of the reasons for editing.

Not all cases of gall-bladder disease were considered as chronic. A single acute attack of illness followed by surgery or other treatment did not warrant classification of the condition as chronic. Repeated attacks were considered as evidence of chronicity. In these instances the attending physician's statement concerning the cause of illness indicated the condition to be chronic. Not all hernias were considered as chronic. If remedial surgery took place soon after discovery of the condition, the illness was classed as acute.

A rise in blood pressure during pregnancy was not considered as a chronic condition unless the attending physician indicated that the patient had chronic hypertension. Embolism as a cause of death subsequent to an operation was not considered as a chronic condition even though it is classed as a disease of the arteries. The doctor's diagnosis and the patient's complaints over a period of time were the important guides as to whether certain conditions should be considered as chronic or as an acute illness.

A single example of the second reason for editing may be cited. A patient with coronary disease may have reported repeated attacks of neuritis in the left shoulder and arm. The attending physician's statement attributed these attacks to coronary disease and coronary disease was considered as the sole chronic condition.

The editing of all but twenty-four of the 1,465 major chronic diagnoses was done by one person, the author of this paper.

[3] Cecil's Textbook of Medicine, 5th and 6th Editions, were used as a guide in the editing process (4).

Then each case was re-edited by another member of the staff in order to detect inconsistencies in the first editing. The cases were then all checked again by the first editor.

A consistent effort was made to avoid overstatement or understatement of the amount of chronic illness reported by the observed population. Most of the illnesses reported were those known to be of a progressive nature and there was no question as to their classification. Rheumatoid arthritis and osteoarthritis may be cited as examples.

Coding of Chronic Disease. The code provided for division of cases of chronic disease into the following classes:

Ambulatory

Class 1. These cases had no disability from the condition and no medical care for it during observation.

Class 2. These cases had no disability but did have medical care at some time during observation.

Class 3. These cases had one or more disabling episodes of illness from the chronic disease at some time during observation.

Ambulatory But Disabled for Work Throughout Observation

Class 4. These cases had no episodes of more severe disability, that is, no bed attacks during observation.

Class 5. These cases had one or more episodes of bed illness which were due to the particular chronic illness present.

Nonambulatory (Bed Cases)

Class 6. These cases were confined to bed throughout observation. Cases in institutions for the tuberculous, for the feeble-minded, and for mental disorder were included in this class even though not all of their time was spent in bed.

Except for the cases in Class 1, a card was coded for each study-year that the case was present in the population. A study-year was a twelve-month period beginning, respectively, in June, 1938, June, 1939, June, 1940, June, 1941, and June, 1942. It was indicated on each card the particular study-year in which the case was present. The single card for cases in Class

1 gave the date of onset or first diagnosis of illness, the study-year of first observation, the study-year in which the case was terminated, and the total months observed in the morbidity study. Thus it was possible to count these cases in each of the specific study-years in which they were present.

For cases in Class 3 a card was coded for each study-year that the case was present in the population observed that year. In addition, a special card was coded for each disabling episode suffered by these cases. The code for these cards included the date of onset of disability, the duration of disability, and the study-year of termination of the disabling attack. Thus each disabling episode could be allocated to the specific study-year in which it occurred.

The special card (disabling attack) for this class was coded in order to study the risk of disabling episodes for persons with a specific diagnosis of chronic disease and who were not disabled throughout the entire period of their observation. All persons in Classes 1, 2, and 3 may be considered as those at special risk of such episodes. Also, these episodes can be related to the total observed population in order to express the general risk of such illness.

There was a further reason for coding the special card (disabling attack) for cases in Class 3. It is of interest to learn how chronic illness manifests itself over a period of time. Is the risk of disability for specific diagnoses greatest at the time of first diagnosis and does that risk diminish with time? Or is the disease of such a rapidly progressive nature that the risk of disability increases with time? It may be that such questions cannot be answered in a period so short as five years. However, it will be of interest to examine the data from this point of view.

It should be pointed out that cases of chronic disease were not transferred from one class to another in different years. For example, if a case in Class 3 became permanently disabled he was not transferred to one of the permanently disabled classes (4, 5, or 6) but remained in Class 3.

Table 1 shows the number of diagnoses of major chronic

CLASSIFICATION OF CONDITION OF PERSON WITH SPECIFIC DIAGNOSIS DURING OBSERVATION	NUMBER OF DIAGNOSES OF CHRONIC ILLNESS	PER CENT
TOTAL	1,465	100.0
Ambulatory:		
1. No Disability, no Medical Care During Observation	281	19.2
2. No Disability, but Medical Care at Some Time During Observation	344	23.5
3. Disability at Some Time During Observation	695	47.4
Ambulatory, but Disabled for Work Throughout Observation		
4. Disabled for Usual Work but no Bed Attacks from Chronic Conditions	85	5.8
5. Disabled for Usual Work and Bed Attack at Some Time During Observation		
Nonambulatory, Bed Case Throughout Observation		
6. Bed Cases Throughout Observation	60	4.1

Table 1. Classification of diagnoses of major chronic illness, Eastern Health District of Baltimore, June, 1938-May, 1943.

disease in each of the classes which have been outlined. Only about 10 per cent of the total were disabled throughout observation and at the other extreme 19 per cent had no disability or medical care during that period.

The classification "major" chronic disease includes heart disease, hypertension or high blood pressure, arthritis, tuberculosis, diabetes, chronic nephritis, rheumatic fever, varicose veins, chronic gall-bladder disease, syphilis, malignant neoplasm, peptic ulcer, toxic goiter, epilepsy, mental deficiency, psychoses and psychoneuroses, and other important but relatively rare conditions, such as Parkinson's disease, cerebral palsy, and multiple sclerosis. (*See* Appendix 1)

METHOD OF COUNTING CASES OF CHRONIC DISEASE

There is need to stress the fact that the counting of chronic disease cases among persons observed over a considerable period

of time presents a problem more complex than is true for a relatively short time period such as one year. At the beginning of observation a certain proportion of the population is reported to be affected by the presence of chronic illness. As time goes on those persons not affected are at risk of developing a chronic condition to the point that a first diagnosis of the condition is made. In addition, those persons who reported the presence of a chronic disease at the beginning of observation are also at risk of developing a different and unrelated chronic condition. For example, a person with mild hypertrophic arthritis has the risk of developing heart disease or cancer as do others of the same age and sex in the general population. If heart disease or

Table 2. Diagnoses of major chronic disease among males and females, Eastern Health District of Baltimore, June, 1938–May, 1943.[1]

DIAGNOSIS CLASS	ANNUAL RATE PER 1,000 POPULATION[3]			NUMBER OF CONTINUING AND NEW CASES		
	Total	Male	Female	Total	Male	Female
TOTAL CASES	198.4	155.6	240.3	4,134	1,599	2,535
Arthritis	40.4	25.7	54.8	842	264	578
Heart Disease	33.6	27.3	39.7	700	281	419
Hypertensive Vascular Disease and Arteriosclerosis	20.4	13.6	26.9	424	140	284
Psychoneurosis and Nervousness	15.1	9.1	20.9	315	94	221
Rheumatic Fever[2]	13.5	12.5	14.4	282	130	152
Varicose Veins	10.5	2.9	17.9	219	30	189
Gall-Bladder Disease	7.6	1.4	13.7	159	14	145
Diabetes	7.4	4.5	10.3	155	46	109
Mental Deficiency	7.1	8.1	6.5	148	83	65
Psychoses	5.3	5.1	5.4	111	54	57
Tuberculosis	5.1	5.4	4.8	107	56	51
Syphilis	4.6	4.4	4.7	95	45	50
Neoplasm (Malignant)	3.6	2.6	4.5	74	27	47
Peptic Ulcer	3.3	6.6	0.5	68	64	4
Goiter (Toxic)	1.9	0.7	3.0	39	7	32
Other Chronic Disease	19.0	25.7	12.5	396	264	132

[1] This Table excludes "crippling conditions" shown in Table 9, in "Cause of Illness Among Males and Females." Milbank Memorial Fund *Quarterly,* October, 1950, xxviii, No. 4, p. 417.
[2] Includes cases of rheumatic fever with rheumatic heart disease.
[3] Based upon 10,282 male-person years and 10,550 female-person years.

cancer did develop in such a person the condition was con-
sidered as a new case of chronic disease. It was not regarded
as a complication of arthritis nor as contributory to any illness
from arthritis; nor was arthritis considered as contributory to
illness from heart disease or cancer. If there were disability
from either illness or medical care for either illness, disabling
days and medical care were assigned only to the particular
chronic condition which caused the disability and for which
medical care was given.

In this study all diagnoses of chronic disease were counted
because, in community planning for adequate facilities for care
and treatment of chronic disease, it is advantageous to know
the size of the problem in terms of the number of diagnoses
rather than solely on the basis of persons affected. For example,
the patient with arthritis and heart disease or cancer needs
treatment for both conditions.

The population was composed of person-years of life of
people who were observed for varying time periods in the
thirty-four blocks which were studied from three to five years.
A person observed for five years was counted as five person-
years of life. If that same person reported the presence of
diabetes during the first year of the study, he was counted as a
diabetic also in the subsequent four years of his observation.
Thus the rate of illness of chronic disease is an average annual
rate based on all cases diagnosed as conditions in the category
"chronic disease."

Table 2 shows the number of diagnoses of specific major
chronic diseases present in the population of the Eastern Health
District during the period June, 1938, to May, 1943.[4] The cases
are counted as those continuing in each year in which they
were present plus the new diagnoses during the period. This
table presents the same data as Table 9 in the previous publica-
tion "Cause of Illness Among Males and Females." (1) Table

[4] There were printer's errors in this table in the reprint publication. In cases of
syphilis and neoplasm, digits were transposed. Cases of syphilis among females should
have been 50 instead of 05 and neoplasm among females should have been 47 instead
of 74.

3 presents the annual incidence of new diagnoses of specific major chronic disease among males and females. The population base for both of these tables is composed of the total years of life observed. The data in both of these tables represent the average annual experience throughout the study; one table indicates the amount of chronic disease present in the population, old plus new diagnoses, and the other (Table 3) the incidence of new diagnoses of chronic illness.

The method of counting cases of chronic illness is shown in greater detail in Tables 4 and 5. Table 4 shows the data for arthritis and Table 5 presents the same type of data for heart disease. Both are based upon the population of the seventeen blocks observed for five years. Column 1 shows the persons

Table 3. Annual incidence of new diagnoses of major chronic disease among males and females, Eastern Health District of Baltimore, June, 1938–May, 1943.[1]

DIAGNOSIS CLASS	RATE PER 1,000 POPULATION			NUMBER OF CASES		
	Total	Male	Female	Total	Male	Female
TOTAL CASES	23.62	18.19	28.91	492	187	305
Arthritis	4.61	2.92	6.26	96	30	66
Heart Disease	5.14	4.77	5.50	107	49	58
Hypertensive Vascular Disease and Arteriosclerosis	3.26	2.24	4.27	68	23	45
Psychoneurosis and Nervousness	2.16	0.78	3.51	45	8	37
Rheumatic Fever[2]	1.20	1.46	0.95	25	15	10
Varicose Veins	0.62	0.39	0.85	13	4	9
Gall-Bladder Disease	1.06	0.19	1.90	22	2	20
Diabetes	0.48	0.58	0.38	10	6	4
Mental Deficiency	0.0			0		
Psychoses	0.38	0.29	0.47	8	3	5
Tuberculosis	0.86	0.78	0.95	18	8	10
Syphilis	0.34	0.29	0.38	7	3	4
Neoplasm (Malignant)	1.15	0.88	1.42	24	9	15
Peptic Ulcer	0.48	0.78	0.19	10	8	2
Goiter (Toxic)	0.10	0.0	0.19	2	0	2
Other Chronic Diseases	1.78	1.85	1.71	37	19	18

[1] Person years = 10,282 male years and 10,550 female years.
[2] Includes cases of rheumatic fever with rheumatic heart disease.

present in June of each study-year; Column 2 indicates the number of cases present (onset prior to observation) in June of each study-year; Column 3 records the number of new diagnoses during each year; the reason for termination of cases is indicated in Columns 4 and 5; Column 6 shows the cases that moved into the population, all of whom were diagnosed prior to observation; and Column 7 indicates the total number of cases present in each study-year.

In morbidity studies, person-years of life form the denominators for obtaining rates of illness. In dealing with chronic disease the problem is determination of the numerator. For example, if this were a one-year study a rate expressing the amount of arthritis in the population offers no particular prob-

Table 4. Count of cases of arthritis in each year—seventeen city blocks observed for five years. Eastern Health District of Baltimore, 1938–1943.

Study Year	Persons Present June of Each Study Year	Cases Present in June of Each Year (Onset Prior to Observation)	New Cases Diagnosed During Year	Terminations During Study Year		Case Moved in (Onset Prior to Observation)	Total Cases Present During Year
				Moved Out During Year	Deaths During Year[1]		
	Col. 1	Col. 2	Col. 3	Col. 4	Col. 5	Col. 6	Col. 7
1st Study Year (6, 1938–5, 1939)	2,969	81	12	7	0	7	100
2nd Study Year (6, 1939–5, 1940)	2,893	93	12	5	0	10	115
3rd Study Year (6, 1940–5, 1941)	2,838	110	14	7	2	5	129
4th Study Year (6, 1941–5, 1942)	2,894	120	13	9	1	3	136
5th Study Year (6, 1942–5, 1943)	2,743	126	5	9	0	6	137
Total for 5 Years	14,337	530	56	37	3	31	617

[1] Cause of death was not due to arthritis; all died from heart diseases.

lem. The numerator is the 100 cases present during the year divided by 3,014 years of life. The rate is then 33.2 per 1,000. Following the same procedure over a period of two years, the numerator becomes 122, that is, 81 plus 24 new cases diagnosed in the two years, plus 17 who moved into the population. The denominator is 5,931 and the resulting rate is 20.5 per 1,000 person-years. If this same procedure be carried out over the entire five-year period, the rate becomes 12.0 per 1,000 person-years.

It is obvious that to obtain a meaningful rate of arthritis based on a population observed over a period of two years or five years, the same method of determination of the denominator must be applied to the determination of the numerator. In other words, cases of arthritis must be counted in each year

Table 5. Count of cases of heart disease in each year—seventeen city blocks observed for five years. Eastern Health District of Baltimore, 1938-1943.

| STUDY YEAR | PERSONS PRESENT JUNE OF EACH STUDY YEAR | CASES PRESENT IN JUNE OF EACH YEAR (Onset Prior to Observation) | NEW CASES DIAGNOSED DURING YEAR | TERMINATIONS DURING STUDY YEAR | | CASE MOVED IN (Onset Prior to Observation) | TOTAL CASES PRESENT DURING YEAR |
				Moved Out During Year	Deaths During Year		
	Col. 1	Col. 2	Col. 3	Col. 4	Col. 5	Col. 6	Col. 7
1st Study Year (6, 1938–5, 1939)	2,969	75	11	5	11	5	91
2nd Study Year (6, 1939–5, 1940)	2,893	75	14	7	12	4	93
3rd Study Year (6, 1940–5, 1941)	2,838	74	19	11	7	6	99
4th Study Year (6, 1941–5, 1942)	2,894	81	18	9	9	6	105
5th Study Year (6, 1942–5, 1943)	2,743	87	9	6	5	2	98
Total for 5 Years	14,337	392	71	38	44	23	486

in which they are present in the population. This principle applies to any chronic condition.

In Tables 4 and 5, which present cases of arthritis and heart disease, recovery from illness did not appear as a reason for termination of the case. However, recovery is a possibility for specific chronic illnesses. Cases may recover from such major chronic conditions as tuberculosis, syphilis, peptic ulcer, rheumatic fever, toxic goiter, cancer, psychoneurosis, psychosis, gall-bladder disease, and hernia. Time and medical care are important factors in recovery from these illnesses. If recovery takes place during observation, the case should be terminated so that the count of cases of chronic illness does not at any time include persons with a history of disease. It should include only those with a chronic condition present at the time of observation. For example, in this study the category "tuberculosis" does not include cases classed as "arrested" or "apparently cured"; only those with active disease were counted.

Table 6 shows the incidence of new diagnoses of arthritis

Table 6. Incidence of new diagnoses (cases) of arthritis and heart disease— seventeen city blocks studied for five years. Eastern Health District of Baltimore, 1938-1943.

Study Year	Rate Per 1,000 Person Years		Number of Cases with First Diagnosis		Person Years of Observation
	Arthritis	Heart Disease	Arthritis	Heart Disease	
1st Study Year (6, 1938–5, 1939)	3.98	3.65	12	11	3,014
2nd Study Year (6, 1939–5, 1940)	4.11	4.78	12	14	2,917
3rd Study Year (6, 1940–5, 1941)	4.94	6.70	14	19	2,835
4th Study Year (6, 1941–5, 1942)	4.85	6.71	13	18	2,683
5th Study Year (6, 1942–5, 1943)	1.99	3.58	5	9	2,515
Total for 5 Years	4.01	5.08	56	71	13,964

and heart disease in each study-year in the seventeen city blocks observed for five years. It is apparent that in the fifth study-year incidence fell sharply. This was true of both conditions. Evidently by the fifth year some selection in the observed population had taken place.

Tables 7, 8, and 9 show various ways of expressing the amount of arthritis and heart disease present in the population in each of the five study-years. Table 7 shows the prevalence of these conditions in June of each year. Table 8 shows the number of cases present in each year; here the denominator is the total persons observed in each year. Table 9 shows the number of cases of arthritis and heart disease and the rate is based on person-years of observation.

It is evident that in this study rates based upon person-years of observation are higher than when based upon persons observed at the beginning of each study-year (June) or on total persons observed during the year. The reason for this is the relatively high rate of moving of the population in each year.

Table 7. Prevalence of cases of arthritis and heart disease in June of each year—seventeen city blocks observed for five years. Eastern Health District of Baltimore, 1938–1943.

Study Year	Cases Per 1,000 Population (Cases Onset Prior to Obs.)		Cases Present in June of Each Year (Onset Prior to Obs.)		Persons Present in June of Each Year
	Arthritis	Heart Disease	Arthritis	Heart Disease	
1st Study Year (6, 1938–5, 1939)	27.28	25.26	81	75	2,969
2nd Study Year (6, 1939–5, 1940)	32.15	25.92	93	75	2,893
3rd Study Year (6, 1940–5, 1941)	38.76	26.07	110	74	2,838
4th Study Year (6, 1941–5, 1942)	41.47	28.00	120	81	2,894
5th Study Year (6, 1942–5, 1943)	45.94	31.72	126	87	2,743
Total for 5 Years	36.97	27.34	530	392	14,337

STUDY YEAR	RATE PER 1,000 PERSONS		TOTAL CASES PRESENT DURING YEAR		TOTAL PERSONS PRESENT DURING YEAR
	Arthritis	Heart Disease	Arthritis	Heart Disease	
1st Study Year (6, 1938–5, 1939)	27.38	24.92	100	91	3,652
2nd Study Year (6, 1939–5, 1940)	32.37	26.18	115	93	3,553
3rd Study Year (6, 1940–5, 1941)	37.85	29.05	129	99	3,408
4th Study Year (6, 1941–5, 1942)	41.39	31.95	136	105	3,286
5th Study Year (6, 1942–5, 1943)	44.98	32.17	137	98	3,046
Total for 5 Years	36.41	28.68	617	486	16,945

Table 8. Number of cases of arthritis and heart disease present in each year—seventeen city blocks observed for five years. Eastern Health District of Baltimore, 1938–1943.

Table 9. Number of cases of arthritis and heart disease present in each year—seventeen city blocks observed for five years. Eastern Health District of Baltimore, 1938–1943.

STUDY YEAR	RATE PER 1,000 PERSON YEARS		TOTAL CASES PRESENT DURING THE YEAR		PERSON YEARS OF OBSERVATION
	Arthritis	Heart Disease	Arthritis	Heart Disease	
1st Study Year (6, 1938–5, 1939)	33.18	30.19	100	91	3,014
2nd Study Year (6, 1939–5, 1940)	39.42	31.88	115	93	2,917
3rd Study Year (6, 1940–5, 1941)	41.97	34.92	129	99	2,835
4th Study Year (6, 1941–5, 1942)	50.69	39.14	136	105	2,683
5th Study Year (6, 1942–5, 1943)	54.47	38.97	137	98	2,515
Total for 5 Years	44.19	34.80	617	486	13,964

The rates shown in Table 8 which include new cases are too low because the person observed two months has the same weight in the denominator as one observed twelve months although the risk for each is different. Addition of the rates in Tables 6 and 7, incidence based on person-years of observation and prevalence in June, probably affords the best expression of chronic illness. For example, this results in a rate of arthritis of 31.26 per 1,000 in the first study year. This rate is only slightly lower than the rate for this year shown in Table 9.

Rates based on person years of observation were used in the total experience presented in Table 2 of this paper and in Table 9 of the paper "Cause of Illness Among Males and Females." (1) This type of rate was not considered the best or the most accurate expression of the amount of chronic disease in the observed population. However, it was desired to show the total amount of illness in the population and most of the total is composed of cases of acute illness. The rate of chronic illness, most of which is prevalence, cannot be added to the total illness rate unless the same denominator or population base is used for both acute and chronic illness.[5]

This brings us to the dilemma of all longitudinal morbidity studies. Sydenstricker called the illness rate based upon a period of twenty-eight months, "morbidity." In the study of the Committee on the Costs of Medical Care, Collins also called the total illness rate "morbidity." Morbidity in both studies includes prevalence and incidence of illness. The same is true of the study in the Eastern Health District of Baltimore. It is necessary to combine prevalence of illness with incidence of illness in order to express the total amount of illness present in the population over a period of time.

[5] It is recognized that for purposes of accuracy when dealing with the incidence of chronic disease that specific chronic illnesses should not be included in the population at risk. For example, if arthritis be considered, those known to have arthritis should be excluded from the population at risk of developing arthritis. Corrections such as this were not made when the total rate of illness from all causes was considered because it was thought best not to change the population base being used.

Epidemiology of the Johns Hopkins School of Hygiene and Public Health and to the Baltimore City Health Department for generous assistance and cooperation which greatly facilitated the carrying on of the study of illness in the Eastern Health District of Baltimore.

An especial acknowledgment is made to Dr. Margaret Merrell of the Department of Biostatistics of the Johns Hopkins School of Hygiene and Public Health who pointed out the need of a detailed description of how chronic disease cases were counted in this particular longitudinal study.

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APPENDIX I.

MAJOR CHRONIC ILLNESSES

	Code Numbers[1]
1. Tuberculosis	020–036, 038, 039
2. Syphilis	060–069
(061 is classed with cardiovascular disease)	
(063 is classed with psychoses)	
3. Malignant neoplasms	100–169
4. Rheumatic fever	200–202
5. Diabetes	210–219
6. Goiter—toxic	220, 222
7. Pernicious anemia	250
8. Aplastic anemia	259
9. Alcoholism (chronic)	270
10. Apoplexy (stroke)	290
11. Multiple sclerosis	303
12. Parkinson's disease	305
13. Spastic paraplegia	307
14. Psychoses	320–329
15. Psychoneuroses	330–334
16. Mental deficiency	335

Code Numbers[1]

17. Epilepsy — 336
18. Heart disease — 360–365
19. Hypertensive heart disease — 370–375
20. Other heart — 380, 381, 382, 389
21. Functional disease of heart — 388
22. Hypertensive vascular disease — 390–399
23. Arteriosclerosis — 400
24. Other diseases of the arteries — 403, 409
25. Varicose veins of lower extremities — 410
26. Plebitis and thrombophlebitis — 420, 421
27. Peptic ulcer — 520–527
28. Hernia — 550, 553
29. Diverticulosis — 579
30. Choleocystitis with or without calculi — 585, 586
31. Nephritis (chronic) — 600
32. Hypertensive vascular-renal disease — 607
33. Calculi of kidneys and ureters — 619, 620
34. Prostatitis (chronic) — 632
35. Arthritis, rheumatoid, osteo-arthritis and other forms — 620–629
36. Osteomyelitis — 730
37. Osteitis deformans (Paget's disease) — 731
38. Brittle bones (Perthes disease) — 734
39. Spina Bifida — 750
40. Congenital malformation of the heart — 753
41. Nervousness — 786
42. Behavior problems — 787

CRIPPLING AND DISABLING CONDITIONS

1. Cataract — 341
2. Other conditions of vision — 349
3. Deafness — 352
4. Old fracture — 733
5. Other diseases of the joints — 739
6. Other deformities due to previous disease or injury — 742
7. Other diseases of organs of movement — 749
8. Ill-defined diseases — 789

MINOR CHRONIC ILLNESSES

1. Gonococcus infection — 041
2. Dermatophytosis — 092
3. Non-malignant tumors — 170–199
4. Goiter—non-toxic — 221, 229
5. Diseases of endocrine glands — 230–239
6. Obesity — 241
7. Malnutrition — 242

[1] Code numbers are those from the Manual For Coding Causes of Illness—according to a Diagnosis Code For Tabulating Morbidity Statistics : U. S. Public Health Service, Miscellaneous Publication, No. 32, U. S. Government Printing Office, Washington, 1944.

Code Numbers[1]

8. Facial paralysis	310
9. Neuritis	316
10. Migraine	337
11. Glaucoma	340
12. Strabismus	342
13. Otitis media and other ear	350–359 (except 352)
14. Hemorrhoids	415
15. Other circulatory	429
16. Bronchitis	471
17. Sinusitis	495
18. Asthma	501
19. Other respiratory (emphysema)	509
20. Colitis (chronic)	539
21. Appendicitis (chronic)	549
22. Indigestion (chronic)	560
23. Salpingitis	650
24. Chronic cervicitis	652
25. Pelvic disease (chronic)	658
26. Menopause	663
27. Menstrual disorder	664
28. Other female genital	666
29. Psoriasis	715
30. Other skin conditions	719
31. Curvature of spine	735
32. Sacro-iliac disease	736
33. Lumbago	782
34. Neuralgia	784
35. Headache (chronic)	785

THE RISK OF ATTACK OF RESPIRATORY ILLNESS AMONG PARENTS OF CHILDREN OF VARIOUS AGES

JANE E. COULTER AND DORIS TUCHER[1]

THERE are some well-established facts in the epidemiology of minor respiratory diseases. General morbidity surveys have shown that slightly more than 40 per cent of all illness during a year is due to these diseases (1, 2). The "common cold," which is the acute respiratory disease most frequent in occurrence, is considered the most highly infectious of the communicable diseases. It is also known that children suffer more frequently from respiratory illness than do adults. The incidence of such illness is highest in children under 10 years of age and declines regularly as age increases, except for a slight increase at the young adult ages.

The purpose of the analysis presented in this report is to learn whether adults in family units with young children have a greater risk of illness from respiratory diseases than do those in families with no very young children.

DATA AND METHOD OF STUDY

The data used in this study include records of respiratory illness obtained over a three-year period from families in two communities, Pleasantville and Mt. Kisco, in Westchester County, New York.

The two communities were fairly comparable with respect to size. According to the 1940 Census, there were 4,454 persons living in the incorporated village of Pleasantville and 5,941 in the village of Mt. Kisco. Sixteen per cent of the population of Pleasantville were foreign born compared with 21 per cent in Mt. Kisco. In both communities the foreign born were chiefly Italian. Negroes formed a very small proportion of the population in either place; about 1 per cent in Pleasantville and 3 per cent in Mt. Kisco.

The periodic survey of families for the purpose of collection of illness records was the method employed in this study. All families in which there were one or more children attending grade school or high school in each of the two communities were included in the study. These families were visited every twenty-eight days during the three school years September to June, 1946–1949. On each visit to the family, inquiry was made about acute respiratory illnesses which had occurred among their members during the past four weeks. Visits were not made during the summer months because it was believed that observation during that period would be incomplete since some children go to summer camps and often the entire family is away from the community for part or all of the summer.

Each family visitor was given a list of the common acute respiratory illnesses in the terminology generally used by the family informant. The list is as follows:

1. Cold, head cold, sneezing attack, sinusitis.
2. Sore throat, tonsillitis, septic sore throat, streptococcus sore throat, pharyngitis, quinsy, laryngitis, hoarseness, swollen cervical glands.
3. Bronchitis, chest cold, tracheitis, croup, cough.
4. Grippe, influenza, intestinal influenza or grippe.
5. Pneumonia, pleurisy, and asthma.
6. Earache with a cold or without a cold, otitis media, running ear, and mastoiditis.

Inquiry was made about the presence or absence of each type of illness among members of the family.

The sickness record included the nature of the illness as stated by the informant, usually the mother, the date of onset and duration of illness, the onset and duration of disability, and the number of days in bed, the amount of medical care and, if hospitalized, the number of days in the hospital.

Acute respiratory illness as reported in this analysis includes head colds or coryza, colds with sore throat, tonsillitis and septic sore throat, colds with chest complications, tracheitis, bron-

chitis or cough, and influenza. Their distribution in order of frequency was as follows: head colds, 47 per cent; colds with sore throat, 21 per cent; tonsillitis, 5 per cent; colds with chest symptoms, 22 per cent; and influenza or grippe, 5 per cent. Cases of intestinal influenza or intestinal grippe are excluded.

There were three family visitors and one supervisor in each community. No visitor was to make more than ten visits a day. A careful check of the visiting rate in each community was made day by day and month by month to be sure that the work was not being done in undue haste in one community as compared with the other. A constant check of the quality of the work of the different family visitors was made. Every effort was made to keep the visiting at an equal rate and to maintain an equal quality of work in both communities.

The mean number of families visited during the three school years of the special study was 530 in Pleasantville and 570 in Mt. Kisco. The families in Pleasantville included some 2,100 persons and those in Mt. Kisco, 2,400. In each community there were about 900 school-age children and 180–200 pre-school-age children.

Earlier analyses have shown that the two communities were similar with respect to the weekly incidence of acute respiratory illness in each of the three school years studied (3, 4). Therefore for the study being reported upon, the total three school-year experience of the two communities has been combined.[2] The families have been grouped according to the ages of the children in them. The groups are as follows:

Group 1. Those families having only children 9 years of age or younger;

Group 2. Those families having both children over 9 years of age and those 9 or younger;

Group 3. Those families in which the children were over 9 years of age.

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[2] The population is expressed as persons and not person years. It is the summation of the total persons observed in each school year in each community. Each school year includes the nine months, September–May. The cases of illness included are those which had their onset within the nine-month period, September–May, in each school year.

OCCUPATIONAL CLASS	FAMILY GROUP		
	Group 1, Children 9 Years of Age or Younger	Group 2, Children Over 9 Years and Those 9 or Younger	Group 3, Children Over 9 Years of Age
	PER CENT		
TOTAL	100.0	100.0	100.0
Professional and Managerial	50.9	40.9	42.2
Clerical and Skilled	27.5	30.8	30.7
Semiskilled and Unskilled	21.6	28.3	27.1
	NUMBER		
TOTAL	844	851	1,057
Professional and Managerial	430	348	446
Clerical and Skilled	232	262	325
Semiskilled and Unskilled	182	241	286

Table 1. Occupational class of the heads of the households in the three family groups. Pleasantville and Mt. Kisco, 1946–1949.

CHARACTERISTICS OF THE FAMILIES

The distribution of the heads of the household by occupational class[3] within each family group is shown in Table 1. The Group 1 families were slightly weighted by the professional and managerial class. In this group the professional and managerial class constituted about 50 per cent of the families. Approximately 40 per cent of the Group 2 and Group 3 families were in this class. Conversely, these latter groups had a higher proportion of families in the clerical and skilled class and in the semiskilled and unskilled class, approximately 31 and 28 per cent respectively.

[3] Coding of occupational class was based upon the Alphabetical Index of Occupations and Industries. U. S. Department of Commerce, Bureau of the Census, Sixteenth Census of the United States: 1940.

The previous reports on the study of acute respiratory illness in Westchester County have shown that the higher the occupational class the higher was the incidence of acute respiratory illness (3, 4). It was concluded that there was no reason to believe that acute respiratory illness is selective of persons in one particular social class compared with another. Rather, it was believed that these differences were due to a subjective factor—family attitude toward illness. Therefore, to assure comparability, the three family groups classified by age of children were each divided according to the occupation of the head of the household: (1) professional and managerial; (2) clerical and skilled workers; and (3) semiskilled and unskilled workers.

The mean age of the head of the household and of the wife is shown by family group and occupational class in Table 2. The heads and wives in the Group 1 families—those with the youngest children—had the lowest mean ages of the three family groups. The household heads in Group 1 had a variation in mean age from 37 years in the semiskilled and unskilled class to 39 years in the professional and managerial class. The heads of household in Group 2 and Group 3 families were approximately 44 and 48 years of age, respectively. The mean age of the wives in the Group 1 families was 35–36 years. The Group 2 and Group 3 wives were 39 and 43–44 years of age, respectively. The mean ages of the household heads and wives increased regularly as the age of the children in the family increased.

The median size of the family by family group and by occupational class is shown in Table 3. In the professional and managerial class, the Group 1 families had a median size of approximately five members. The Group 2 families which had children both over, under, and including 9 years of age had a larger median size, approximately six members. The smaller median size of the Group 3 families, about four members, was due in part to the fact that some of the teen-age children were away at school and that older children may have left the house-

Occupational Class and Family Group	Mean Age	Standard Error of Mean	Standard Deviation
		HEADS	
Professional and Managerial			
Group 1, Children 9 Years of Age or Younger	39.3	±0.36	7.38
Group 2, Children Over 9 Years and Those 9 or Younger	43.4	±0.34	6.30
Group 3, Children Over 9 Years of Age	47.5	±0.31	6.42
Clerical and Skilled			
Group 1, Children 9 Years of Age or Younger	38.1	±0.52	7.77
Group 2, Children Over 9 Years and Those 9 or Younger	43.5	±0.42	6.73
Group 3, Children Over 9 Years of Age	47.9	±0.43	7.32
Semiskilled and Unskilled			
Group 1, Children 9 Years of Age or Younger	37.1	±0.54	7.28
Group 2, Children Over 9 Years and Those 9 or Younger	44.3	±0.56	8.46
Group 3, Children Over 9 Years of Age	48.1	±0.49	7.79
		WIVES	
Professional and Managerial			
Group 1, Children 9 Years of Age or Younger	35.5	±0.33	6.70
Group 2, Children Over 9 Years and Those 9 or Younger	39.2	±0.25	4.65
Group 3, Children Over 9 Years of Age	43.9	±0.28	5.90
Clerical and Skilled			
Group 1, Children 9 Years of Age or Younger	34.5	±0.47	7.18
Group 2, Children Over 9 Years and Those 9 or Younger	39.1	±0.37	6.02
Group 3, Children Over 9 Years of Age	43.5	±0.33	5.86
Semiskilled and Unskilled			
Group 1, Children 9 Years of Age or Younger	34.5	±0.55	7.44
Group 2, Children Over 9 Years and Those 9 or Younger	38.5	±0.46	7.10
Group 3, Children Over 9 Years of Age	43.2	±0.45	7.41

Table 2. Mean age of the heads of the households and wives by occupational class and family group. Pleasantville and Mt. Kisco, 1946–1949.

Occupational Class and Family Group	First Quartile	Median Family Size	Third Quartile
Professional and Managerial			
Group 1, Children 9 Years of Age or Younger	4.1	4.7	5.5
Group 2, Children Over 9 Years and Those 9 or Younger	4.7	5.5	6.6
Group 3, Children Over 9 Years of Age	3.7	4.4	5.1
Clerical and Skilled			
Group 1, Children 9 Years of Age or Younger	4.1	4.6	5.3
Group 2, Children Over 9 Years and Those 9 or Younger	5.1	5.9	7.2
Group 3, Children Over 9 Years of Age	3.7	4.5	5.3
Semiskilled and Unskilled			
Group 1, Children 9 Years of Age or Younger	4.0	4.5	5.0
Group 2, Children Over 9 Years and Those 9 or Younger	5.1	5.9	7.5
Group 3, Children Over 9 Years of Age	3.8	4.5	5.6

Table 3. Median number of persons per family by occupational class and family group. Pleasantville and Mt. Kisco, 1946-1949.

hold. The same differences in size of family by family group was true for the other occupational classes. It is of interest to note that the median size of Group 1, 2, and 3 families is similar in each occupational class.

The mean number of children per family is shown by age groups in Table 4. The children are classified by the occupational class of the head of the household and by family group. The Group 1 families in each occupational class had a greater concentration of young children aged 0-4 and 5-9 than did the Group 2 families. In the 0-4 year age group, the Group 1 families had a mean number of children varying from 0.66 to 0.76 among the occupational classes compared to a variation of 0.51

to 0.64 in the Group 2 families. In the 5–9 year age group, the Group 1 families had a mean number of children varying from 1.16 to 1.32 among the occupational classes compared to a variation of 0.95 to 1.03 in the Group 2 families. The Group 2 and Group 3 families in each occupational class had fairly similar concentrations of older children aged 10–14 and 15–18. In the 10–14 year age group, the means ranged from 0.98 to 1.13 and 0.73 to 0.83 among the occupational classes for the Group 2 and Group 3 families, respectively. In the 15–18 year age group, the means varied from 0.43 to 0.59 and 0.79 to 0.88 among the occupational classes for the Group 2 and Group 3 families, respectively. It should be emphasized that these means are crude means.

Table 4. Mean number[1] of children per family classified by occupational class and family group. Pleasantville and Mt. Kisco, September—May, 1946–1949.

| OCCUPATIONAL CLASS AND FAMILY GROUP	AGE GROUPS OF CHILDREN			
	0–4	5–9	10–14	15–18
Professional and Managerial				
Group 1, Children 9 Years of Age or Younger	0.76	1.32		
Group 2, Children Over 9 Years and Those 9 or Younger	0.51	1.02	0.98	0.43
Group 3, Children Over 9 Years of Age			0.83	0.79
Clerical and Skilled				
Group 1, Children 9 Years of Age or Younger	0.74	1.26		
Group 2, Children Over 9 Years and Those 9 or Younger	0.64	1.03	1.05	0.56
Group 3, Children Over 9 Years of Age			0.73	0.81
Semiskilled and Unskilled				
Group 1, Children 9 Years of Age or Younger	0.66	1.16		
Group 2, Children Over 9 Years and Those 9 or Younger	0.63	0.95	1.13	0.59
Group 3, Children Over 9 Years of Age			0.76	0.88

[1] These are crude means.

INCIDENCE OF RESPIRATORY ILLNESS

Minor respiratory disease has a characteristic age variation. This is illustrated in Figures 1 and 2 which show the annual incidence of acute respiratory illness by age as recorded in four special studies. Figure 1 shows the incidence by age in the Public Health Service family study (1924) and in the study among Baltimore families (1928–1929 and 1929–1930) (5, 6). Figure 2 shows the same type of data noted in the Cost of Medical Care study (1928–1931) and in the Eastern Health District study (1938–1943) (7, 8). Although these studies were made at different times and in different places, they show striking similarity in the age variation of illness. Respiratory illness has a characteristic age pattern that apparently has not changed with time or place.

In these investigations the acute respiratory illness rate was

Fig. 1. Age-specific incidence, total respiratory illnesses, Baltimore families, November 18, 1928–November 16, 1929, and November 17, 1929–November 15, 1930. Public Health Service Families, January 1, 1924–December 31, 1924.
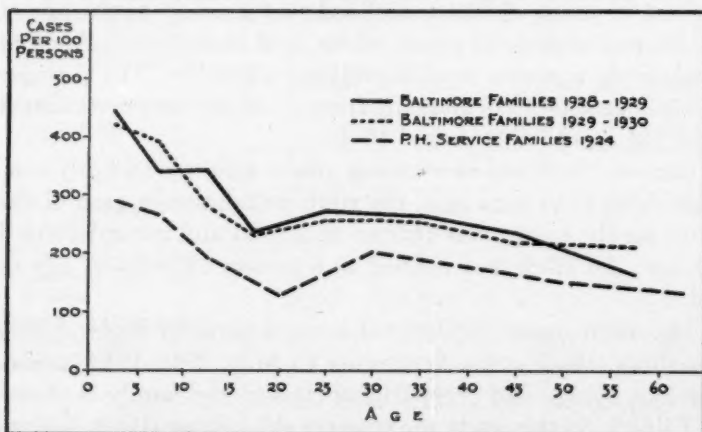
(This Figure has been reproduced by permission from:
Van Volkenburgh, V. A. and Frost, W. H.: Acute Minor Respiratory Diseases Prevailing in a Group of Families Residing in Baltimore, Maryland, 1928–1930. Prevalence, Distribution and Clinical Description of Observed Cases. *The American Journal of Hygiene*, January, 1933, Vol. xvii, No. 1, pp. 122–153.)
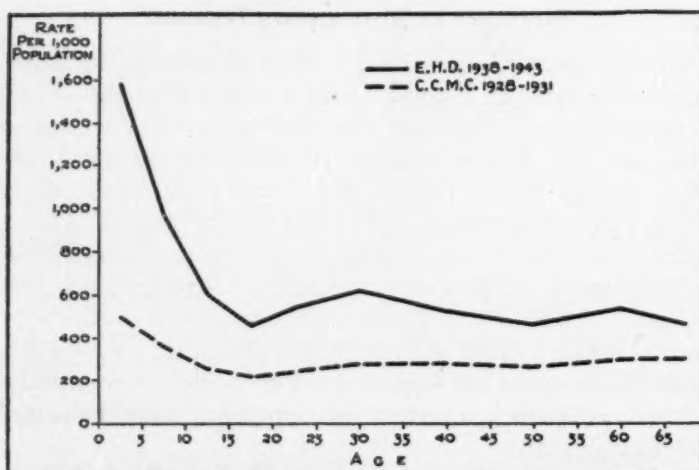
Fig. 2. Age-specific incidence of total minor respiratory illnesses in the population studied by the Committee on the Costs of Medical Care, 1928–1931, and in the sample population of the Eastern Health District of Baltimore, 1938–1943.

highest in young children, declined progressively to the age of 15–19, rose slightly in young adults, and thereafter declined to a relatively constant level throughout adult life. The younger children aged 0–9 had annually from 40–60 per cent more illness than did those children aged 10–19.

Because the illness rate among adults maintains a fairly constant level at various ages, the adult population in each of the three family groups was treated as a total and not subdivided by age. An adult was defined as a person 19 years of age or older.

The mean annual incidence of acute respiratory illness during the three school years, September to May, 1946–1949, among children by age and occupational class of the family is shown in Table 5. In this study the younger children aged 0–9 also had from 40 to 60 per cent more respiratory illness than the older children aged 10–18. These results correspond with the higher rate of respiratory illness among younger children compared with older children which was noted in earlier studies (5–8).

The children in the Group 1 families aged 0–4 and 5–9 had higher rates of respiratory illness than the children of corresponding ages in the Group 2 families. This was true of each occupational class. These lower rates in the Group 2 family children aged 0–4 and 5–9 may be due to a lowered risk of contracting infection from family contact because of less concentration in the Group 2 families of these young children who are most susceptible to respiratory illness. The children aged 10–18 in the Group 2 and Group 3 families have a similar level in ill-

Table 5. Mean incidence of acute respiratory illness during three school-years of 9 months each among children by family group and occupational class. Pleasantville and Mt. Kisco, 1946–1949.

Age Grouping of Children	Age			
	0–4	5–9	10–14	15–18
	Rate Per 1,000 Population			
PROFESSIONAL AND MANAGERIAL				
Group 1, Children 9 Years of Age or Younger	3,100.6	3,061.7		
Group 2, Children Over 9 Years and Those 9 or Younger	2,483.0	2,292.1	1,950.0	1,460.0
Group 3, Children Over 9 Years of Age			1,852.2	1,630.7
CLERICAL AND SKILLED				
Group 1, Children 9 Years of Age or Younger	2,232.6	2,517.1		
Group 2, Children Over 9 Years and Those 9 or Younger	1,928.6	1,765.8	1,384.1	1,290.5
Group 3, Children Over 9 Years of Age			1,780.6	1,606.1
SEMISKILLED AND UNSKILLED				
Group 1, Children 9 Years of Age or Younger	2,041.3	2,231.1		
Group 2, Children Over 9 Years and Those 9 or Younger	1,809.2	1,663.8	1,175.8	909.1
Group 3, Children Over 9 Years of Age			1,282.4	1,174.6

ness rates. It appears that the presence of younger children in the Group 2 families does not increase the risk of attack of respiratory illness among their older siblings.

The mean annual incidence of acute respiratory illness among adults by the occupational class of the family and by family group is shown in Table 6. The adult population was classed by relationship to the head of the household. The parents of the children (heads and wives) who presumably had the most intimate contact with the children in the family showed marked differences in illness rates among family groups (Figure 3). In the professional and managerial class, the household heads in Group 1 had an illness rate 88 per cent higher than the heads in Group 3. The wives in Group 1 in the same occupational class had an illness rate 40 per cent higher than those in Group 3. In the clerical and skilled class the household heads of the Group 1 families had a rate exceeding that of the Group 3 household heads by 17 per cent. The wives followed the same pattern as

Table 6. Mean incidence of acute respiratory illness during 3 school years of 9 months among adults by family group and occupational class. Pleasantville and Mt. Kisco, 1946–1949.

OCCUPATIONAL CLASS AND FAMILY GROUP	RELATIONSHIP		
	Heads	Wives	Other Related Adults
Professional and Managerial			
Group 1, Children 9 Years of Age or Younger	1,349.9	1,761.1	965.5
Group 2, Children Over 9 Years and Those 9 or Younger	973.8	1,513.0	666.7
Group 3, Children Over 9 Years of Age	718.3	1,255.2	810.0
Clerical and Skilled Workers			
Group 1, Children 9 Years of Age or Younger	911.1	1,547.8	744.7
Group 2, Children Over 9 Years and Those 9 or Younger	689.2	1,100.0	668.7
Group 3, Children Over 9 Years of Age	776.6	1,134.4	624.0
Semiskilled and Unskilled Workers			
Group 1, Children 9 Years of Age or Younger	733.3	1,226.5	347.8
Group 2, Children Over 9 Years and Those 9 or Younger	497.8	1,110.6	555.1
Group 3, Children Over 9 Years of Age	504.0	762.8	632.2
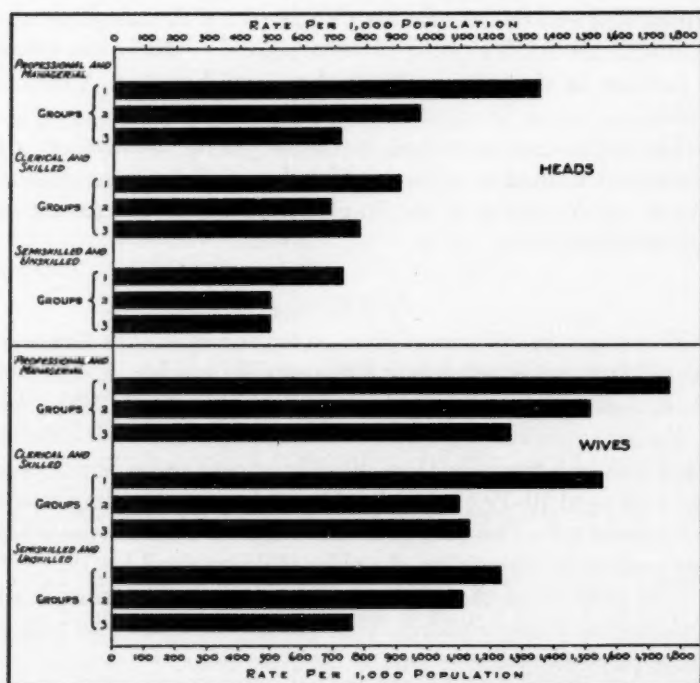
Fig. 3. Incidence of minor respiratory illness among household heads and wives in three groups of families classified according to occupation of the head of household.

the husbands. Those in Group 1 had a rate 36 per cent higher than those in Group 3. The household heads and wives in the semiskilled and unskilled class also showed the same relationship of rates. The household heads in the Group 1 families had a rate 45 per cent higher than Group 3 and the wives in Group 1 had a rate 61 per cent higher than those in Group 3.

The other related adults in the families were mainly adult children or parents of the head of the household or the wife. Although these other related adults presumably had a less intimate contact with the children in the family than the parents, those in Group 1 had 19 per cent more illness than those in Group 3 in each occupational class with the exception of the

semiskilled and unskilled class (Table 6). This exception may be due to the small number of other related adults in the Group 1 families in that class. These data are shown in Appendix Table I.

Thus, the environmental factor of young children in the household seemed to affect the incidence of acute respiratory illness among adults in the family, particularly the parents of the children.

SUMMARY

This paper has presented data on acute respiratory illness reported by families residing in Pleasantville and Mt. Kisco, New York, during the three school years September–May, 1946–1949.

Earlier studies in respiratory illness have shown that children aged 0–9 had annually from 40–60 per cent more illness than children aged 10–19 (5–8). In this study corresponding results were obtained. The young children aged 0–9 had from 40–60 per cent more illness than the older children aged 10–18.

The purpose of this particular analysis was to learn if the presence of young children in a family increased the risk of acute respiratory illness among their parents.

The families were divided into three groups according to the ages of the children in them. The families in each of these three groups were classified according to the occupational class of the head of the household in order to eliminate any bias in illness rates arising from differences in family attitude toward illness.

The household heads and wives, the parents of the children, showed marked differences in illness rates when grouped by the age of the children in the family. The fathers in the families having only young children aged 0–9 had from 17–88 per cent more illness than the fathers in the families having children aged 10–18. The mothers in the families having only young children had from 36–61 per cent more illness than did the mothers in the families having older children.

Thus it was concluded that the young children who have a

high incidence of acute respiratory illness seem to present a greater risk of illness to their parents than do the older children.

Acknowledgments are made to Dr. Mildred W. Wells and to the Westchester County Department of Health for generous assistance and cooperation which greatly facilitated the study of acute respiratory illness.

An especial acknowledgment is made to the families in Pleasantville and Mt. Kisco who participated in the study.

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8. Eastern Health District Study in Baltimore, Maryland, 1938–1943. Made by the United States Public Health Service and the Milbank Memorial Fund. Unpublished data.

Appendix Table 1. Population observed during 3 school-years classed by occupational class and family group. (Pleasantville and Mt. Kisco combined), September to May, 1946–1949.

Age Grouping of Children	Heads[1] All Ages	Wives All Ages	Other Related Adults, All Ages	Children All Ages	0–4	5–9	10–14	15–18
	RELATIONSHIP				AGE OF CHILDREN			
PROFESSIONAL AND MANAGERIAL								
Group 1, Children 9 Years of Age or Younger	423	427	116	895	328	567		
Group 2, Children Over 9 and Those 9 or Younger	343	347	144	1,022	176	356	340	150
Group 3, Children Over 9 Years of Age	426	435	221	724			372	352
CLERICAL AND SKILLED								
Group 1, Children 9 Years of Age or Younger	225	230	94	464	172	292		
Group 2, Children Over 9 and Those 9 or Younger	251	260	166	861	168	269	276	148
Group 3, Children Over 9 Years of Age	291	320	242	501			237	264
SEMISKILLED AND UNSKILLED								
Group 1, Children 9 Years of Age or Younger	180	181	69	333	121	212		
Group 2, Children Over 9 and Those 9 or Younger	223	235	227	797	152	229	273	143
Group 3, Children Over 9 Years of Age	252	274	242	468			216	252

[1] Female heads of the household have been counted as wives. Heads of the household observed 8 weeks or less have been excluded.

Appendix Table 2. Number of illnesses during 3 school-years among persons by occupational class and family group. (Pleasantville and Mt. Kisco combined), September–May, 1946–1949.

AGE GROUPING OF CHILDREN	RELATIONSHIP				AGE OF CHILDREN			
	Heads All Ages	Wives All Ages	Other Related Adults, All Ages	Children All Ages	0-4	5-9	10-14	15-18
PROFESSIONAL AND MANAGERIAL								
Group 1, Children 9 Years of Age or Younger	571	752	112	2,753	1,017	1,736		
Group 2, Children Over 9 and Those 9 or Younger	334	525	96	2,135	437	816	663	219
Group 3, Children Over 9 Years of Age	306	546	179	1,263			689	574
CLERICAL AND SKILLED								
Group 1, Children 9 Years of Age or Younger	205	356	70	1,119	384	735		
Group 2, Children Over 9 and Those 9 or Younger	173	286	111	1,372	324	475	382	191
Group 3, Children Over 9 Years of Age	226	363	151	846			422	424
SEMISKILLED AND UNSKILLED								
Group 1, Children 9 Years of Age or Younger	132	222	24	720	247	473		
Group 2, Children Over 9 and Those 9 or Younger	111	261	126	1,107	275	381	321	130
Group 3, Children Over 9 Years of Age	127	209	153	573			277	296

SOCIAL AND PSYCHOLOGICAL FACTORS AFFECTING FERTILITY

XIV. PREFERENCE FOR CHILDREN OF GIVEN SEX IN RELATION TO FERTILITY[1]

JEANNE E. CLARE AND CLYDE V. KISER

THE existence of preferences for children of given sex is evident not only from Biblical and anthropological literature but also from everyday experience. In some societies the preferences are heavily conditioned by culture. Thus in oriental agrarian societies, the higher value placed upon sons than daughters probably arises not only from presumed economic advantages of sons to parents but also from considerations of religion and social prestige. Although cross-cultural references to the subject may suggest stronger and more frequent desires for sons than for daughters, this preference is by no means universal. Sumner has stated "in all variations of the life conditions, in all forms of industrial organization, and at all stages of the arts, conjunctures arise in which the value of children fluctuates, and also the relative value of boys and girls turns in favor, now of one, now of the other."[2]

It is possible that within our own country the increasing urbanization of the population has been accompanied by a decrease in actual or assumed economic advantages of sons over daughters. If this is true, one might reasonably suppose that in our urban areas preferences for children of given sex tend to

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[1] This is the fourteenth of a series of reports on a study conducted by the Committee on Social and Psychological Factors Affecting Fertility, sponsored by the Milbank Memorial Fund with grants from the Carnegie Corporation of New York. The Committee consists of Lowell J. Reed, Chairman; Daniel Katz; E. Lowell Kelly; Clyde V. Kiser; Frank Lorimer; Frank W. Notestein; Frederick Osborn; S. A. Switzer; Warren S. Thompson; and P. K. Whelpton.

The present report is based largely upon a previous treatment of the data in Clare, Jeanne E.: Preference Regarding the Sex of Children and its Relation to Size of Family. Master's Thesis, Department of Sociology, Faculty of Political Science, Columbia University, June, 1951, 36 pp. plus tables and charts (unpublished).

[2] Sumner, William Graham: FOLKWAYS. Boston, Ginn and Company, 1906, p. 312.

be simply personal preferences based upon considerations other than the economic.

The above is not to say that the existence of preferences regarding sex of children is less prevalent in urban than in rural areas of this country. On the contrary, it is possible that interest in the sex of prospective children is more pronounced among couples planning to have only one or two children than it is among couples expecting to have larger families as a matter of course. Certainly the writers know of no reason to suppose that prospective parents in the city are less interested than their rural counterparts in discussing whether they want the child to be a boy or a girl. It is recognized, of course, that discussion of the sex of the young hopeful frequently is only half-serious and that it often ends with the stock remark "We'll take the package whatever it is and we won't send it back."

The present paper provides some data on the prevalence, nature, and strength of parental preferences regarding sex of children among couples in the Indianapolis Study. Its chief purpose, however, is to present the analysis of data relevant to the hypothesis "Preferences regarding the sex of children affect the size of family."

Previous Studies. As far as can be determined, most of the previous studies in this area have been concerned more with the first-mentioned problems, i.e., a determination of the existence of preferences regarding the sex of children, than with the problem stated in our hypothesis. In fact, in one study by Winston[3] and in another by Harper,[4] the hypothesis being tested here is taken rather for granted and used as a basic assumption of the investigations. This assumption was that where a preference as to the sex of children existed the size of family would be limited. It was further assumed that there was a strong preference for males. It was reasoned by both investigators

[3] Winston, Sanford: Birth Control and Sex Ratio at Birth. *American Journal of Sociology*, September, 1932, xxxviii, No. 2, pp. 225–31.
[4] Harper, Marian: Parental Preference with Respect to the Sex of Children. Master's Thesis, Department of Sociology, University of Chicago, December, 1936 (unpublished).

that upon receiving a male child, families were less likely to have more children. Accordingly, a larger number of last-born children would be males. To test this, sex ratios were computed for the last-born children and for all children ever born. It was expected that if the hypotheses were valid there would be higher sex ratios for last-born children than for all children of the couples studied.

Winston's data related to 5,466 completed families in the ABRIDGED COMPENDIUM OF AMERICAN GENEALOGY. His working hypothesis was that for such an educationally, socially, and economically superior group the sex ratio at birth among children in these families would be directly affected by the desire for male children. He found that generally higher sex ratios prevailed for last-born children than for all children ever born. He also found that more two-child families had two sons than two daughters, and that of those with two children of opposite sex more had as the last child a son than a daughter. Winston concluded from these findings that the "prevalence of the desire for male offspring on the part of socially superior parents, together with their knowledge of methods of birth control, appears to be significant in relation to the high sex-ratio at birth of this selected group."[5]

Using the same method, Harper also found a relatively high sex ratio for the last-born children of families in BURKE'S PEERAGE and WHO'S WHO IN AMERICA. The main part of her investigation, however, centered on 11,937 families living in Wisconsin cities of 20,000 population and over in 1934 and meeting certain requirements.[6] Her comparison of observed and "expected" sex ratios of last-born children indicated no consistent direction of possible sex preference except in the white-collar occupational group where the preference was toward males. Furthermore, she found none of the differences between sex ratios of last-born children and those of all children in the

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[5] Winston, *op. cit.*, p. 231.

[6] Marriage took place between 1919 and 1923; marriage not terminated by death or divorce within ten years of marriage date; neither spouse previously married; wife not over 25 years of age at marriage and husband not over 30; and couple had at least one child within ten years of marriage date and no multiple births.

Wisconsin series to be statistically significant. She found, though, that the proportion of families with the first two children of opposite sex was higher in families that were limited to two children than in families with three children. Thus she concluded that the preference for children of both sexes is more prevalent than favoritism toward a given sex. It is recognized, of course, that this type of preference may result in desire for a boy if the couple already has a girl or girls and *vice versa*.

In his study of a group of officers in the United States Army Air Corps and their wives, Flanagan included a question regarding the effect upon the size of family "if predetermination of sex of children were made possible by medical science." About 89 per cent of the officers answering and 82 per cent of the wives answering stated that such a condition would have made no difference in their size of family or plans for additional children. About 11 per cent of the officers and 17 per cent of the wives replied that such a condition might have caused them to have one to three more children. Less than 1 per cent of either husbands or wives declared it would have meant one child less.[7]

Data for Present Study. The analysis presented in this paper is based upon data collected in Indianapolis mainly in 1941, as part of the Study of Social and Psychological Factors Affecting Fertility.[8]

[7] Flanagan, John C.: A Study of Factors Determining Family Size in a Selected Professional Group. *Genetic Psychology Monographs*, 1942, xxv, p. 75.

[8] The general purpose, scope, and methods of the Study have been described in detail in previous articles. The Study was conducted in Indianapolis in 1941 and the data for the present analysis relate to an adjusted sample of 1,444 "relatively fecund" couples with the following characteristics: husband and wife native white, both Protestant, both finished at least the eighth grade, married during 1927–1929, neither previously married, husband under 40 and wife under 30 at marriage, and eight or more years spent in a city of 25,000 population or over since marriage. Couples with these characteristics were located by means of a preliminary Household Survey of virtually all white households in Indianapolis.

For purposes of the Study, all couples with four or more live births were classified as "relatively fecund" regardless of other circumstances. Couples with 0–3 live births were classified as "relatively fecund" unless they knew or had good reason for believing that conception was physiologically impossible during a period of at least 24 or 36 consecutive months since marriage (24 for never-pregnant couples, 36 for others). Failure to conceive when contraception was not practiced "always" or "usually" during periods of above durations was considered "good reason" for such

The identification of the existence and direction of parental preferences regarding sex of children is based mainly upon "multiple-choice" replies of wives and husbands to several questions designed specifically to afford bases for classification by "preferences regarding sex of children." The form on which these questions appeared was filled out by the wife and husband separately, in the presence of the interviewer, usually at a pre-arranged evening appointment in the home of the couple.

Two questions asked of all 1,309 "relatively fecund" couples with one or more live births[9] were as follows:

If you could have only one child, would you rather have: — a boy; — a girl; — don't care?

If you could have only two children, would you rather have: — a boy and a girl; — two boys; — two girls; — don't care?

The following two questions were asked respectively of (a) 693 couples that had children of only one sex before the birth of the last child; and (b) 591 couples that had children of both sexes at the time of the interview:

> How much were you and your husband [wife] encouraged to have your last child by the reason of wanting a boy if you had only girls, or a girl if you had only boys? (Possible replies: encouraged very little, little, some, much, very much.)
> How much are you and your husband [wife] discouraged from having more children . . . [because of] already having children of each sex? (Possible replies: discouraged very much, much, some, little, very little or not at all.)

In addition, wives and husbands were asked to indicate (a) which of a list of factors (including "wanting a boy if you had only girls, or a girl if you had only boys") were of first, second, and third importance in encouraging them to have their last

belief. Couples not classified as "relatively fecund" were considered "relatively sterile." The 533 "relatively sterile" couples were not asked to supply data such as those relating to preference as to sex of children.

[9] Since these two questions are hypothetical or suppositional in nature they could have been asked of childless as well as fertile couples. As will be seen later, however, part of the method in this analysis is the establishment of categories on the basis of whether the first child or first two children were of the sex preferred.

child; and (b) which of a list of factors (including "already have children of each sex") were of first, second, and third importance in discouraging them from having more children.

It is recognized that there are various limitations and possible biases in replies to questions such as those listed above. Perhaps the chief limitation applies to the first two questions regarding sex preference if the couple could have only one child and only two children. Although these are suppositional questions, there is good evidence in Tables 1 and 2 that the replies are strongly colored by the actual sex of the first child and of the first two children. Thus among the wives whose first child was a girl, 38 per cent stated that they would prefer a girl if they could have only one child and only 7.5 per cent stated that they would prefer a boy under this condition. In contrast, among wives whose first child was a boy, only 11 per cent stated that they would prefer a girl and 37 per cent said that they would prefer a boy if they could have but one child. A similar situation is found in the husbands' replies, although the husbands' preferences for a boy if they could have only one child are in general much more frequent than those of wives.

Despite the *ex post facto* nature of the replies regarding preferences as to sex of an only child or of only two children and the consequent evidence of rationalization of replies, such rationalization is itself a social reality. In other words, although preferences regarding sex of children may affect fertility, those preferences themselves are conditioned by actual sex of existing children. It would be well to have classifications based upon preferences before marriage or before the birth of any children, but there is perhaps no reason to suppose that such preferences are any more real than those expressed after the birth of one or two children. Like other attitudes, those regarding sex of children may change with time and circumstances and it is presumably the current attitude conditioned by current circumstances that has bearing on the planning of additional children. In this connection it may be stated that the tendency for couples to be satisfied with the actual sex of existing children

probably tends to reduce the effect of sex preferences on fertility.

Whatever may be the extent and implication of rationalization, there are several other points of interest in Tables 1 and 2. In the first place, over half (53 per cent) of the mothers and 42 per cent of the fathers in the Study actually indicated that they would have no preference regarding the sex of an only child. In the second place, as already stated, the husbands' preferences as to sex of an only child ran strongly toward those for a son. Approximately 48 per cent of the fathers and only 22 per cent of the mothers stated that they would prefer a boy if they could have only one child. About 25 per cent of the mothers and only 10 per cent of the fathers stated preference for a daughter under these conditions (Table 1).

The higher proportion of fathers than of mothers stating that they would want a boy if they could have only one child may reflect a certain amount of culturally conditioned ego satisfaction of fathers in having a son. The desire to have the family name carried on may be one element in this situation[10] and the folk notion that the having of a son is associated with masculinity of the father may be another.

Despite the relatively strong preferences of fathers for a son

Table 1. Parental preference as to sex of an only child in relation to actual sex of the first child.

ACTUAL SEX OF FIRST CHILD	TOTAL NUMBER	PERCENTAGE DISTRIBUTION BY SEX PREFERENCE			
		Total	No Preference	A Girl	A Boy
ALL WIVES	1,307[a]	100.0	52.8	25.4	21.8
Female	677	100.0	54.1	38.4	7.5
Male	630	99.9	51.4	11.4	37.1
ALL HUSBANDS	1,309	99.9	42.3	9.9	47.7
Female	679	100.0	53.9	15.3	30.8
Male	630	99.9	29.8	4.1	66.0

[a] Excludes two unknowns with respect to sex preference.

[10] Data collected in the Study suggest that husbands attach a little more importance than wives to the factor of carrying on the family name. (*See* Table 5.)

if the couple were to have only one child, a larger proportion of the fathers than of the mothers in the Study (79 per cent as compared with 69 per cent) stated that they would prefer *a girl and a boy* if they could have only *two* children. The preference for "two boys" under this condition is about the same for fathers and mothers, 8 and 9 per cent. However, only about 3 per cent of the fathers as compared with 10 per cent of the mothers expressed a preference for two girls. Only 9 per cent of the fathers and 12 per cent of the mothers stated that they would have no preference as to sex of the two children if they could have only two.

Preferences as to Sex of Children in Relation to Actual Number and Sex Order of Children. Tables 3 and 4, giving preferences as to sex of an only child and only two children, respec-

Table 2. Parental preference as to sexes of only two children among all couples with children; among one-child couples, by sex of child; and among couples with two or more children, by sex of first two children.

ACTUAL SEX OF ONLY CHILD OR FIRST TWO CHILDREN	NUMBER COUPLES	PER CENT WIVES REPLYING					PER CENT HUSBANDS REPLYING			
		Total	No Preference	A Girl and A Boy	Two Girls	Two Boys	No Preference	A Girl and A Boy	Two Girls	Two Boys
ALL FERTILE COUPLES	1,309	100	12.0	69.2	10.1	8.7	9.0	79.2	3.4	8.3
Couples With Only One Child, By Sex of Child										
Total	365	100	10.1	70.4	13.7	5.8	7.1	85.2	3.3	4.4
Female	192	100	11.5	61.5	26.0	1.0	8.3	83.3	6.3	2.1
Male	173	100	8.7	80.3	0.0	11.0	5.8	87.3	0.0	6.9
Couples With Two or More Children, By Sex of First Two Children										
Total	944	100	12.7	68.8	8.7	9.9	9.7	76.9	3.5	9.9
Male and Female	485	100	7.4	88.7	2.9	1.0	5.4	91.8	0.4	2.5
Two Females	231	100	19.5	48.9	29.0	2.6	17.7	65.8	13.4	3.0
Two Males	228	100	17.1	46.5	0.4	36.0	11.0	56.6	0.0	32.5

tively, by number and sex order of all live births to the couple, reveal several points of interest. We have already noted from Tables 1 and 2 the tendency for the preferences as to sex of an only child to correspond with actual sex of the first-born child and for the preferences as to sex of only two children to correspond with actual sex of the first two children. As indicated in Tables 3 and 4 this type of rationalization is decidedly stronger among both wives and husbands actually having only one child in the first instance and only two in the other. Thus, of the 173

Table 3. Preferences as to sex of an only child, by number and sex-order of live births.

ACTUAL SEX OF CHILDREN		NUMBER OF COUPLES	TOTAL PER CENT	PER CENT WIVES REPLYING			PER CENT HUSBANDS REPLYING		
				No Preference	A Girl	A Boy	No Preference	A Girl	A Boy
One Child									
M		173	100	36.4	8.1	55.5	17.9	2.9	79.2
F		192	100	27.6	69.3	3.1	46.4	34.9	18.8
Two Children									
MM		135	100	46.7	8.1	45.2	20.0	6.7	73.3
MF		122	100	73.8	13.9	12.3	43.4	3.3	53.8
FM		153a	100	65.6	26.5	7.9	67.3	1.3	31.4
FF		131	100	57.3	38.2	4.6	54.2	15.3	30.5
Three Children									
MMM		26	100	50.0	11.5	38.5	34.6	0.0	65.4
MMF		28	100	57.1	10.7	32.1	25.0	3.6	71.4
MFM		29	100	62.1	27.6	10.3	44.8	3.4	51.7
MFF		26	100	73.1	7.7	19.2	46.2	0.0	53.8
FMM		32	100	84.4	9.4	6.3	71.9	9.4	18.8
FMF		32	100	71.9	12.5	15.6	43.8	0.0	56.3
FFM		31	100	74.2	12.9	12.9	54.8	0.0	45.2
FFF		29	100	51.7	24.1	24.1	41.4	27.6	31.0
Four or More Children by Sex of									
First	*Last*								
M	M	52	100	40.4	19.2	40.4	40.4	7.7	51.9
M	F	39	100	53.8	10.3	35.9	38.5	5.1	56.4
F	M	41	100	65.9	24.4	9.8	34.1	7.3	58.5
F	F	38	100	63.2	23.7	13.2	60.5	2.6	36.8

a Percentage base for wives is 151 owing to two unknowns with respect to preference as to sex of an only child.

couples whose only child was a boy, only 8 per cent of the wives and 3 per cent of the husbands stated that they would prefer a girl if they could have only one child. Likewise, among the 192 couples whose only child was a girl, only 3 per cent of the wives and 19 per cent of the husbands stated preference for a boy as an only child.

Among mothers of two children of opposite sex, the preferences as to sex of an only child correspond more frequently to the sex of the first child than to that of the second. A similar situation is found with respect to preferences of fathers for a son but not for a daughter. Among mothers and fathers of three or more children whose first and last children were of opposite sex

Table 4. Preferences as to sex of only two children, by number and sex-order of live births.

Actual Sex of Children		Number of Couples	Total Per Cent	Per Cent Wives Replying				Per Cent Husbands Replying			
				No Pref.	A Girl and A Boy	Two Girls	Two Boys	No Pref.	A Girl and A Boy	Two Girls	Two Boys
One Child											
M		173	100	8.7	80.3	0.0	11.0	5.8	87.3	0.0	6.9
F		192	100	11.5	61.5	26.0	1.0	8.3	83.3	6.3	2.1
Two Children											
MM		135	100	14.8	35.6	0.0	49.6	13.3	45.9	0.0	40.7
MF		122	100	0.0	98.4	0.0	1.6	0.0	98.4	0.0	1.6
FM		153	100	3.3	93.5	3.3	0.0	4.6	95.4	0.0	0.0
FF		131	100	18.3	40.5	39.7	1.5	19.1	58.0	19.8	3.1
Three Children											
MMM		26	100	30.8	38.5	0.0	30.8	11.5	46.2	0.0	42.3
MMF		28	100	21.4	78.6	0.0	0.0	3.6	78.6	0.0	17.9
MFM		29	100	27.6	72.4	0.0	0.0	0.0	100.0	0.0	0.0
MFF		26	100	19.2	73.1	3.8	3.8	11.5	84.6	3.8	0.0
FMM		32	100	6.3	84.4	6.3	3.1	15.6	84.4	0.0	0.0
FMF		32	100	12.5	87.5	0.0	0.0	12.5	87.5	0.0	0.0
FFM		31	100	25.8	61.3	12.9	0.0	25.8	71.0	3.2	0.0
FFF		29	100	17.2	51.7	20.7	10.3	17.2	69.0	13.8	0.0
Four or More Children by Sex of											
First	*Last*										
M	M	52	100	11.5	75.0	3.8	9.6	7.7	84.6	0.0	7.7
M	F	39	100	15.4	69.2	7.7	7.7	2.6	82.1	2.6	12.8
F	M	41	100	19.5	70.7	7.3	2.4	7.3	82.9	0.0	9.8
F	F	38	100	13.2	76.3	10.5	0.0	13.2	78.9	0.0	7.9

the preferences regarding sex of an only child also appear to be somewhat more highly correlated with sex of the first child than with sex of the last.

Table 4 points up again the preferences for a child of each sex if the couple were to have only two children. This type of preference is especially strong (over 95 per cent) among parents actually having only a boy and a girl. It was expressed with lowest frequency by parents of two or more children of the same sex and even in these instances the proportions expressing this preference extended from 35 to 69 per cent.

Relation of Preferences as to Sex of Children to Fertility-Planning Status, Socio-Economic Status, and Economic Security of the Couple. As already indicated, Winston adduced the hypothesis that preferences regarding the sex of children may be expected to exist more among couples practicing contraception than among couples not practicing contraception. The writers have undertaken to test this assumption with a breakdown of the present data on preferences regarding sex of an only child and of only two children, by fertility-planning status of the couple. As described in previous articles[11] the 1,444 "relatively fecund" couples in the Indianapolis Study were classified by fertility-planning status on the basis of detailed pregnancy and contraceptive histories, including data on the outcome of pregnancies and attitudes toward each pregnancy. The four broad categories used in the Study, in decreasing degree of success in planning family size, are: number and spacing planned, number planned, quasi-planned, and excess fertility.[12]

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[11] *See especially* Whelpton, P. K. and Kiser, Clyde V.: Social and Psychological Factors Affecting Fertility. VI. The Planning of Fertility. The Milbank Memorial Fund *Quarterly*, January, 1947, xxv, No. 1, pp. 63–111 (Reprint pp. 209–257).

[12] The four categories may be briefly described as follows:

Number and Spacing of Pregnancies Planned. The 403 couples in this group exhibit the most complete planning of fertility in that they had no pregnancies that were not deliberately planned by stopping contraception in order to conceive. The group consists of two major subdivisions: (a) 121 couples practicing contraception regularly and continuously and having no pregnancy, and (b) 282 couples whose every pregnancy was deliberately planned by interrupting contraception in order to conceive.

Number Planned. This group of 205 couples consists mainly of those whose *last* pregnancy was deliberately planned by stopping contraception in order to conceive

Breakdowns of the data were also made by index of socio-economic status of the couple[13] and by index of economic security.[14]

The data charted in Figure 1 indicate no consistent relation of fertility-planning status to parental preferences regarding the sex of an only child. The proportion of wives, but not that of husbands, stating that they would have *no preference* as to the sex of an only child increases slightly with lowering of socio-economic status. On the other hand, the proportion of wives and husbands stating that they would have no preference as to the sex of an only child tends to be somewhat higher among couples of high than of low rating in the index of economic security. However, the relationships observed in Figure 1 are slight and incomplete and virtually no relation is found between preferences as to sex of only two children and the three variables just considered (*See* Appendices i and ii).

but who had one or more previous pregnancies under other circumstances. Because of this, the couples are regarded as having planned the number but not the spacing of their pregnancies.

Quasi-Planned. This group includes 454 couples who did not deliberately plan the last pregnancy in the manner described above but who either wanted the last pregnancy or wanted another pregnancy.

Excess Fertility. This group is composed of 382 couples classified as least successful in planning size of family because one or more pregnancies had occurred after the last that was wanted.

[13] The index of socio-economic status of the couple is based upon the following eight items: average annual earnings of husband since marriage, monthly rent or rental value of home (without utilities) at interview, net worth of couple, husband's longest occupation, purchase price of car, education of husband, education of wife, and score on Chapin's Social Status Scale. A low score indicates high socio-economic status and *vice versa*.

See Kiser, Clyde V. and Whelpton, P. K.: Social and Psychological Factors Affecting Fertility. ix. Fertility Planning and Fertility Rates by Socio-Economic Status. The Milbank Memorial Fund *Quarterly*, April, 1949, xxvii, No. 2, pp. 213, 216 (Reprint pp. 385, 387).

[14] The index of economic security of the couples in the Indianapolis Study is based upon the following items: interviewer's rating of the wife and husband with respect to feeling of economic security, self-ratings of wives and husbands on extent to which economic insecurity discouraged the couple from having more children, degree of confidence in ability to meet future expenses, frequency faced with possibility of husband's pay cut or unemployment, frequency of financial help to relatives, and amount of financial help that could be expected from relatives in an emergency. In this case high index is supposed to be indicative of strong feeling of economic security and *vice versa*.

See Kiser, Clyde V. and Whelpton, P. K.: Social and Psychological Factors Affecting Fertility. xi. The Interrelation of Fertility, Fertility Planning, and Feeling of Economic Security. The Milbank Memorial Fund *Quarterly*, January, 1951, xxix, No. 1, p. 112.
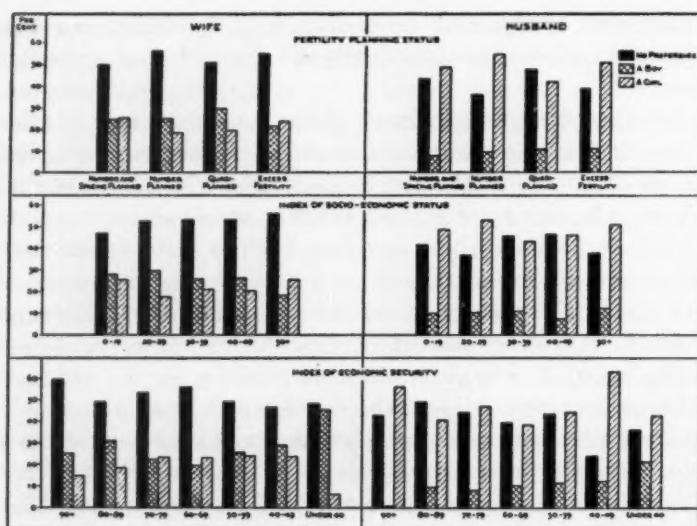
Fig. 1. Percentage distribution of wives and husbands with one or more children by stated preference as to sex of an only child, by fertility-planning status, index of socio-economic status, and index of economic security. (*See* Appendix I.)

RELATION OF PREFERENCES REGARDING SEX OF CHILDREN TO FERTILITY OF THE COUPLE

Some basis for the inference that parental preference regarding sex of children is not a major determinant of family size among couples in the Indianapolis Study is already afforded by the findings that (a) over half of the wives and over 40 per cent of the husbands state that they would have no preference as to sex of even an only child; (b) among those stating a preference as to sex of an only child there is a decided positive relation of those replies to actual sex of the first child of the couple (this suggests that many people may easily reverse their former preferences regarding sex of children on the basis of what the stork brings); and (c) over two-thirds of the wives and over three-fourths of the husbands revealed their liking for children of both sexes by stating that they would want a girl and a boy if they could have only two children.

For further analysis of the relation of preference as to sex of children to fertility, three types of data will be examined: (a) sex ratios of last-born and previous children (following in major respects the methods of Winston and Harper); (b) opinions of wives and husbands on the impact of this factor on their own fertility; and (c) analysis of actual fertility rates in relation to stated preferences regarding sex of an only child and only two children and actual sex of the first or first two children.

Sex Ratios Among the Last-Born and Previous Children of Couples in the Study. As already described, both Winston and Harper found higher proportions of males among last-born children than among all children ever born to groups of prominent people. On the basis of his findings, Winston concluded that a preference existed for males.

Since the data were available, a similar analysis was made for couples in the present Study with the addition that the data are also classified by replies to the question pertaining to the provisional sex preference of an only child.

Figure 2 presents the sex ratios (males per 100 females) for all children except the last born, all children ever born, and the last-born children. These are equivalent to sex ratios at birth because deceased children are included. First of all it should be noted that the sex ratio (101) for all births represented in the Study is lower than the sex ratio at birth in the United States for about the same period (circa 106). This is probably due to sampling variation. In the total sample the sex ratio is higher for last-born children (105) than for all children except the last born (97) but the difference is not statistically significant.

Since the higher sex ratio for last-born children presumably is associated with contraceptive practice, the analysis was also restricted to planned families. Curiously, however, the sex ratio among all last-born children in planned families is 98 as compared with 123 for all except the last born. It is 109 for all children in planned families.

Sex Preference If Only One Child	Number Couples	Number Children	Sex Ratio
ALL COUPLES			
Total	1,309	1,620 / 2,929 / 1,309	97 / 101 / 105
WIFE'S REPLY			
No Preference	690	963 / 1,653 / 690	86 / 93 / 105
A Girl	332	298 / 630 / 332	65 / 54 / 45
A Boy	285	357 / 642 / 285	193 / 231 / 296
HUSBAND'S REPLY			
No Preference	554	720 / 1,274 / 554	69 / 77 / 87
A Girl	130	107 / 237 / 130	65 / 41 / 26
A Boy	625	793 / 1,418 / 625	138 / 148 / 163

MALES PER 100 FEMALES — 0 / 100 / 200 / 300

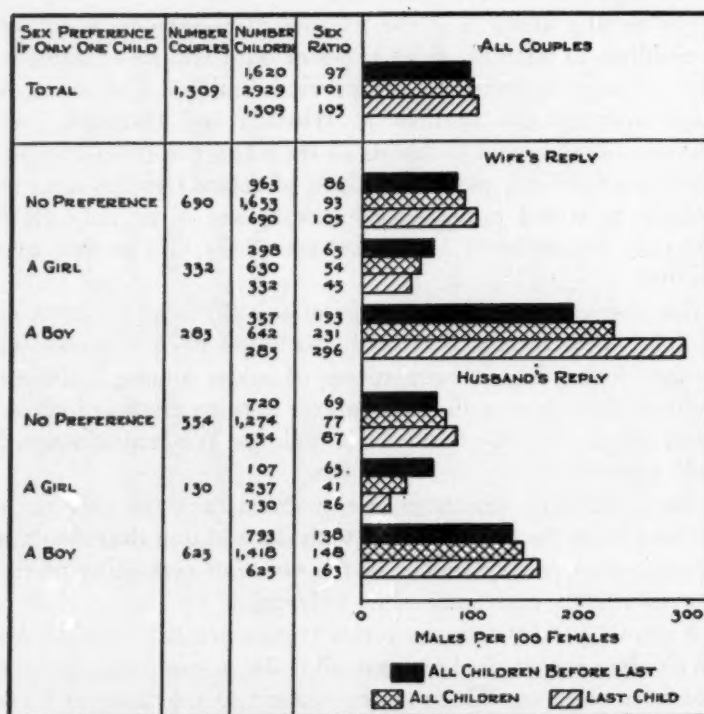■ ALL CHILDREN BEFORE LAST ⊠ ALL CHILDREN ⫽ LAST CHILD

Fig. 2. Sex ratios among all children before the last-born child, all children, and last-born children, by stated preference of wives and husbands regarding sex of an only child.

Perhaps of more interest in Figure 2 is the relation of sex ratios among last-born and previous children to the stated preference of the wife and husband as to the sex of an only child. First, regardless of whether preference of the wife or husband is used as the basis for classification, the sex ratio is highest among children of parents expressing preference for a boy as an only child, in intermediate position for children of parents expressing no preference, and lowest for children of couples expressing preference for a girl.[15] In the second place,

[15] All of the differences in sex ratios by sex preference were found to be statistically significant when sex ratios of either "all children" or "last-born children" were

among children of women or men expressing preference for a boy and among children of either parent expressing impartiality as to sex of an only child, the sex ratio is consistently higher for the last-born than for preceding children. In contrast, among children of parents expressing preference for a girl as an only child, the sex ratio is *lower* for the last-born than for previous children. Although only two differences of this type stand up as statistically significant,[10] the consistency of the patterns described is such that the writers would not interpret them as arising from chance alone. Perhaps in large measure they simply reflect again the tendency for wives and husbands to state sex preferences in terms of actual sex of children. However, to some extent they may reflect a tendency to stop having children after getting a child of the sex preferred, a matter which will be considered in a later section.

At this point it is also relevant to compare certain other findings from the present data with those reported by Winston and Harper. Unlike Winston's finding that more of the two-child families had two boys than two girls, these two types of families are virtually equal in number in the Indianapolis Study (135 with two boys and 131 with two girls). Among the

used as bases for comparison. However, when the sex ratios of all children except the last were used as bases for comparison, no significant difference was found between that for children of women expressing no preference as to sex of an only child (86) and that for children of women expressing preference for a girl (65). (Difference ÷ σ Difference = 1.53.) Likewise no significant difference was found in the corresponding groups based upon the husbands' replies (69 and 65: Difference ÷ σ Difference = .25). For interpretation, a difference is regarded as "not significant" if the quotient (Difference ÷ σ Difference) is under 1.96, as "moderately significant" if the quotient is 1.96–2.57, and as "very significant" if the quotient is larger than 2.57. These three levels of significance are equivalent respectively to $P > .05$, $P = .01–.05$, and $P < .01$.

It should be noted that for tests of significance, sex ratios (males per 100 females) were converted into percentages (males per 100 births). The tests were made more rigorous by appropriate reductions in *n* (number of children) since the numbers shown in Figure 2 are those in the inflated sample. *See* Whelpton, P. K. and Kiser, Clyde V.: Social and Psychological Factors Affecting Fertility. V. The Sampling Plan, Selection, and the Representativeness of Couples in the Inflated Sample. The Milbank Memorial Fund *Quarterly*, January, 1946, xxiv, No. 1, pp. 69–76 (Reprint pp. 183–190).

[10] A significant difference was found between the sex ratio for "last-born" and "all except last-born" children of women preferring a boy as an only child. (Difference ÷ σ Difference = 1.98.) A significant difference was also found between the sex ratio for "last-born" and "all except last-born" children of men preferring a girl if they were to have an only child. (Difference ÷ σ Difference = 2.50.)

Table 5. Percentage distribution of three most important reasons for encouragement in having last child.

REASON ENCOURAGED IN HAVING LAST CHILD	ALL COUPLES REPLYING			COUPLES HAVING CHILDREN OF ONLY ONE SEX PRIOR TO LAST CHILD		
	First	Second	Third	First	Second	Third
ALL WIVES	1,354*	1,354*	1,354*	693	693	693
TOTAL	100.0	100.0	99.9	100.0	100.1	100.0
A Strong Liking for Children	49.3	13.2	9.8	41.7	13.4	9.5
A Belief that it is a Religious Duty to Have a Family	2.2	4.4	3.1	1.6	3.0	2.2
The Traditional Belief that Married Couples Ought to Have Children	9.1	13.2	13.2	6.9	8.4	9.1
A Feeling that it is Important to Carry on the Family Name	0.6	2.1	4.9	0.1	0.6	3.9
A Desire to See What Own Children Would be Like	5.0	14.0	14.5	2.6	5.8	10.2
A Feeling that Children Bring Husband and Wife Closer Together	10.9	22.1	19.2	8.1	20.5	14.0
Not Wanting an Only Child	12.3	11.5	9.4	23.7	19.5	16.2
Not to be Left Childless in Case of Death of Only Child	1.0	4.5	4.7	1.7	7.8	7.6
The Desire of Children for More Brothers and Sisters	2.4	7.4	8.6	2.9	11.1	11.4
Wanting a Girl if Only Had Boys, or a Boy if Only Had Girls	5.2	5.1	7.8	10.0	9.1	13.9
Unknown	2.0	2.5	4.7	0.7	0.9	2.0
ALL HUSBANDS	1,357*	1,357*	1,357*	693	693	693
TOTAL	100.0	99.9	100.1	100.1	99.8	100.0
A Strong Liking for Children	43.7	13.9	11.1	41.1	11.5	12.6
A Belief that it is a Religious Duty to Have a Family	3.5	5.2	4.7	3.5	4.0	2.6
The Traditional Belief that Married Couples Ought to have Children	9.1	16.5	14.7	7.5	14.1	11.0
A Feeling that it is Important to Carry on the Family Name	2.1	3.8	5.5	1.2	2.3	2.9
A Desire to See What Own Children Would be Like	3.5	9.4	13.7	1.9	6.6	11.7
A Feeling that Children Bring Husband and Wife Closer Together	18.0	26.0	19.4	13.0	25.3	16.3
Not Wanting an Only Child	9.7	10.1	6.6	18.0	16.7	10.2
Not to be Left Childless in Case of Death of Only Child	0.4	2.1	5.2	0.7	4.0	9.2
The Desire of Children for More Brothers and Sisters	1.5	3.2	7.1	2.2	3.9	10.0
Wanting a Girl if Only Had Boys, or a Boy if Only Had Girls	5.5	5.4	6.6	9.7	9.8	10.8
Unknown	3.0	4.3	5.5	1.3	1.6	2.7

* Includes responses of all couples who had a live birth and all childless couples with wife pregnant at interview or respondent indicating couple intended to have a child in future. Forty-five childless couples are included on basis of response of wife and 48 on basis of response of husband.

planned families alone, the numbers are 63 with two boys and 62 with two girls.

Like Winston's finding that among two-child families with children of the opposite sex more had a boy than a girl as the last child, the numbers are 153 with a boy as the last child and 122 with a girl as the last. However, among planned families alone, the numbers are 48 and 65, respectively.

Unlike Harper's finding that the proportion of families with the first two children of opposite sex is higher in two-child than in three-child families, these two proportions are virtually equal in the present Study (50.8 per cent for two-child families and 51.1 per cent for three-child families). Among planned families alone, the two proportions are 47.5 and 52.8.

Opinions Regarding the Influence of Preference as to Sex of Children on Own Fertility. For the sample as a whole, preference regarding the sex of children does not seem to be an important determinant of the size of family. Percentage distributions of replies of the wives and husbands as to which of ten listed reasons were of first, second, and third importance in encouraging them to have their last child (Table 5) suggest at first glance the relative unimportance of the factor "wanting a girl if had only boys, or a boy if had only girls." The number of wives and husbands giving this as the reason of first importance is relatively small, 71 wives or 5.2 per cent of the total answering and 75 husbands or 5.5 per cent. Approximately 18 per cent of all wives and husbands list this factor as of first, second, or third importance in encouraging them to have their last child. However, among the 693 couples having children of only one sex before the birth of their last child, 10 per cent of the wives and husbands give this situation as the most important reason for wanting the last child. Approximately one-third of the wives and husbands in this category give it as the reason of first, second, or third importance.

As indicated in Table 6, the wives and husbands designating "wanting a girl (boy) if had only boys (girls)" as the most important reason for having the last child exhibited higher

Table 6. Children ever born per 100 couples by first, second, and third most important reason for encouragement in having last child.

Reason for Last Child	Most Important Reason		Second Most Important Reason		Third Most Important Reason	
	Number Couples	Rate	Number Couples	Rate	Number Couples	Rate
ALL WIVES	1,354a	217	1,354b	217	1,354c	217
A Strong Liking for Children	667	201	179	217	133	226
A Belief that it is a Religious Duty to Have a Family	30	247	59	205	42	238
The Traditional Belief that Married Couples Ought to Have Children	123	260	179	212	179	213
A Feeling that it is Important to Carry on the Family Name	8	*	29	152	66	179
A Desire to See What Own Children Would be Like	68	150	189	161	197	179
A Feeling that Children Bring Husband and Wife Closer Together	147	231	299	224	260	201
Not Wanting an Only Child	167	203	156	233	127	242
Not to be Left Childless in Case of Death of Only Child	14	*	61	220	63	238
The Desire of Children for More Brothers and Sisters	32	269	100	267	117	255
Wanting a Girl if Had Only Boys, or a Boy if Had Only Girls	71	282	69	242	106	250
ALL HUSBANDS	1,357d	216	1,357e	216	1,357f	216
A Strong Liking for Children	593	207	189	190	150	242
A Belief that it is a Religious Duty to Have a Family	47	247	70	230	64	164
The Traditional Belief that Married Couples Ought to Have Children	124	249	224	227	199	189
A Feeling that it is Important to carry on the Family Name	29	210	52	212	75	156
A Desire to See What Own Children Would be Like	47	140	128	192	186	202
A Feeling that Children Bring Husband and Wife Closer Together	244	207	353	205	263	221
Not Wanting an Only Child	131	215	137	241	89	246
Not to be Left Childless in Case of Death of Only Child	5	*	29	217	70	224
The Desire of Children for More Brothers and Sisters	21	262	44	280	97	271
Wanting a Girl if Had Only Boys, or a Boy if Had Only Girls	75	273	·73	258	89	248

* Rate not computed.
a Twenty-seven unknowns included.
b Thirty-four unknowns included.
c Sixty-four unknowns included.
d Forty-one unknowns included.
e Fifty-eight unknowns included.
f Seventy-five unknowns included.

fertility rates than couples listing any other reason as the

Table 7. Percentage distribution of three most important reasons for discouragement in having another child.

REASON DISCOURAGED IN HAVING ANOTHER CHILD	ALL COUPLES ANSWERING			COUPLES HAVING CHILDREN OF EACH SEX AT TIME OF INTERVIEW		
	First	Second	Third	First	Second	Third
ALL WIVES	1,444	1,444	1,444	591	591	591
TOTAL	100.0	99.9	99.8	99.9	100.2	100.2
Cost of Children	50.4	21.4	12.7	50.6	20.0	11.3
Not Being More Interested in Children	1.0	2.4	2.6	0.5	1.0	1.4
Parents Had Hard Time Rearing Children	1.1	6.4	4.4	0.7	4.6	3.4
Sharing House	2.1	4.7	5.7	0.8	5.6	3.0
Conformity with "Our Crowd"	0.1	1.3	1.1	0.2	1.2	1.4
Avoid Being Tied Down	1.9	7.2	12.8	1.5	7.8	12.0
A Feeling that Children Cause Parents to Lose Interest in Each Other	0.5	0.7	1.9	0.7	0.2	1.4
Poor Health of Self	16.6	12.3	8.9	17.4	9.5	9.0
Poor Health of Spouse	2.3	3.7	3.1	3.0	2.0	2.4
Poor Health of Children	1.3	1.2	2.7	0.7	1.9	2.4
Not Sure of Steady Income	11.3	20.3	15.0	9.6	21.8	14.0
Fear or Dread of Pregnancy and Childbirth	5.7	9.3	11.6	2.2	8.0	9.5
Already Has Child of Each Sex	4.5	5.7	10.4	11.0	13.7	23.9
Unknown	1.2	3.3	6.9	1.0	2.9	5.1
ALL HUSBANDS	1,444	1,444	1,444	591	591	591
TOTAL	99.9	100.1	99.9	99.8	100.1	99.9
Cost of Children	42.5	20.6	13.5	46.5	20.0	13.4
Not Being More Interested in Children	1.2	2.9	4.2	1.0	2.5	2.9
Parents Had Hard Time Rearing Children	1.5	5.3	7.8	1.4	4.4	5.9
Sharing House	1.3	6.0	4.5	1.2	4.6	3.2
Conformity with "Our Crowd"	0.3	1.6	1.9	—	2.4	0.5
Avoid Being Tied Down	2.2	5.7	8.0	1.7	7.3	7.1
A Feeling that Children Cause Parents to Lose Interest in Each Other	0.5	1.3	1.8	0.5	1.9	1.5
Poor Health of Self	1.1	3.9	3.5	0.3	2.4	2.5
Poor Health of Spouse	19.9	9.8	7.7	17.1	7.4	8.8
Poor Health of Children	0.8	1.5	1.5	0.8	2.7	1.7
Not Sure of Steady Income	13.6	20.6	17.0	11.3	21.8	16.9
Fear or Dread of Pregnancy and Childbirth	6.2	10.4	10.8	3.2	6.3	7.4
Already Has Child of Each Sex	6.0	5.3	9.3	14.0	12.2	22.2
Unknown	2.8	5.2	8.4	0.8	4.2	5.9

most important. The fertility rates ranked second highest among couples giving the above as the reason of second or third importance. It is possible that continued effort to have a child of the sex desired boosted the fertility rate of these couples.

Under the assumption that preferences regarding sex of children may serve to keep couples that have children of both sexes from having another child, the factor "already having a child of each sex" was included as one of thirteen listed reasons from which wives and husbands in the Study were asked to indicate the most important, second most important, and third most important reason for being discouraged in having another child. In the total sample only 4.5 per cent of the wives and 6.0 per cent of the husbands give the fact of already having children of both sexes as the most important reason for being disinclined to have more children (Table 7). However, approximately 21 per cent of all the wives and husbands give this as one of three most important reasons for discouragement in having another child. Here again, this reason is validly chosen only by couples who had children of each sex at the time of interview. There were 591 couples in this category and when this number is used as the base 11 per cent of the wives and 14.0 per cent of the husbands indicate "already having a child of each sex" as the most important deterrent in having another child. Furthermore, 49 per cent of the wives and 48 per cent of the husbands list it as one of the three most important reasons for not having another child.

It is seen that wives and husbands listing "already having a child of each sex" as the most important reason for not having another child, tend to have higher fertility than those giving other reasons (Table 8). This probably reflects the selective factor inherent in the fact that persons listing this reason had at least two children. However, since the couples list this as an important reason for not having another child, there is the suggestion that sex preference may have been an important inducement for the previous children.

As previously stated, 693 couples who had children of only one sex prior to the conception of the last child were asked

Table 8. Children ever born per 100 couples by first, second, and third most important reason for discouragement from having more children.

REASON FOR DISCOURAGEMENT FROM HAVING MORE CHILDREN	MOST IMPORTANT REASON		SECOND MOST IMPORTANT REASON		THIRD MOST IMPORTANT REASON	
	Number Couples	Rate	Number Couples	Rate	Number Couples	Rate
ALL WIVES	1,444a	203	1,444b	203	1,444c	203
Cost of Children	728	214	309	200	184	179
Not Being More Interested in Children	14	*	35	143	37	151
Parents Had Hard Time Rearing Children	16	*	92	158	64	197
Sharing House	31	139	68	192	82	183
Conformity with "Our Crowd"	1	*	19	*	16	*
Avoid Being Tied Down	27	200	104	214	185	214
A Feeling that Children Cause Parents to Lose Interest in Each Other	7	*	10	*	28	164
Poor Health of Self	239	205	177	189	129	219
Poor Health of Spouse	33	224	54	183	45	224
Poor Health of Children	19	*	18	*	39	203
Not Sure of Steady Income	163	177	293	230	217	200
Fear or Dread of Pregnancy and Childbirth	83	155	134	190	168	201
Already Has Child of Each Sex	65	265	83	265	150	261
ALL HUSBANDS	1,444d	203	1,444e	203	1,444f	203
Cost of Children	614	216	297	197	195	195
Not Being More Interested in Children	17	*	42	174	60	175
Parents Had Hard Time Rearing Children	22	255	76	195	113	161
Sharing House	19	*	86	192	65	165
Conformity with "Our Crowd"	4	*	23	283	28	171
Avoid Being Tied Down	32	200	82	213	115	207
A Feeling that Children Cause Parents to Lose Interest in Each Other	7	*	19	*	26	165
Poor Health of Self	16	*	57	177	51	180
Poor Health of Spouse	288	202	141	184	111	226
Poor Health of Children	12	*	22	309	22	232
Not Sure of Steady Income	197	183	297	214	245	218
Fear or Dread of Pregnancy and Childbirth	89	154	150	173	156	179
Already Has Child of Each Sex	87	245	77	269	135	288

* Rate not computed.
a Eighteen unknowns included.
b Forty-eight unknowns included.
c One hundred unknowns included.
d Forty unknowns included.
e Seventy-five unknowns included
f One hundred twenty-two unknowns included.

Table 9. Percentage distribution of couples having living children of only one sex before conception of the last child, by extent to which the wife or husband was encouraged to have the last child by wanting a child of the other sex, according to number and sex order of children.

ACTUAL SEX OF CHILDREN	PER CENT DISTRIBUTION BY EXTENT ENCOURAGED						
	Number Couples	Total	Very Much	Much	Some	Little	Very Little
REPLIES OF WIFE							
TOTAL	643a	100.0	22.2	11.8	21.3	14.5	30.2
Two Children	459	99.9	16.3	8.7	23.3	18.3	33.3
MM	118	100.1	13.6	9.3	21.2	24.6	31.4
MF	105	99.9	19.0	3.8	18.1	20.0	39.0
FM	118	100.0	20.3	9.3	29.7	8.5	32.2
FF	118	100.0	12.7	11.9	23.7	20.3	31.4
Three Children	125b	100.0	40.8	15.2	16.8	5.6	21.6
MMM	26	100.0	38.5	7.7	19.2	11.5	23.1
MMF	27	99.9	40.7	11.1	18.5	3.7	25.9
FFF	29	99.9	44.8	17.2	17.2	6.9	13.8
FFM	29	99.9	51.7	20.7	17.2	0.0	10.3
Four or More Children	42	100.0	40.5	23.8	11.9	4.8	19.0
All Living Children :							
Male Before Last	23	99.9	43.5	30.4	13.0	0.0	13.0
Female Before Last	19	*					
REPLIES OF HUSBAND							
TOTAL	655c	99.9	17.9	14.0	22.4	15.4	30.2
Two Children	474	99.9	14.1	13.9	21.9	16.2	33.8
MM	120	99.9	2.5	10.0	25.8	20.8	40.8
MF	99	99.9	24.2	9.1	23.2	12.1	31.3
FM	135	100.0	16.3	21.5	12.6	17.0	32.6
FF	120	100.0	15.0	13.3	27.5	14.2	30.0
Three Children	125d	100.0	30.4	12.8	19.2	16.2	21.6
MMM	26	100.0	15.4	15.4	19.2	11.5	38.5
MMF	27	99.9	48.1	0.0	25.9	14.8	11.1
FFF	27	99.9	25.9	14.8	22.2	18.5	18.5
FFM	29	99.9	37.9	24.1	6.9	20.7	10.3
Four or More Children	41	100.1	29.3	17.1	26.8	9.8	17.1
All Living Children :							
Male Before Last	24	99.9	33.3	8.3	33.3	4.2	20.8
Female Before Last	17	*					

* Percentage not computed.

a Excludes fifty wives unknown as to extent encouraged. Includes seventeen one-child couples pregnant at interview.

b Included fourteen wives with live births of different sex order owing to deaths or twins.

c Excludes thirty-eight unknown as to extent encouraged. Includes fifteen one-child couples pregnant at interview.

d Includes fifteen husbands with live births of different sex order owing to deaths or twins and one with children of unknown sex order.

"How much were you and your husband [wife] encouraged to have your last child by . . . wanting a boy if you had only girls, or a girl if you had only boys?" Among the 643 wives answering this question, 22 per cent replied "very much," 12 per cent "much," 21 per cent "some," 14.5 per cent "little," and 30 per cent "very little." For the 655 husbands answering the question, the replies were 18 per cent "very much," 14 per cent "much," 22 per cent "some" 15 per cent "little," and 30 per cent "very little." As noted in Table 9, the degree of encouragement from this factor is much lower among parents of two (one child before the last) than among parents of three (two of the same sex before the last). However, it is approximately the same among the parents of four or more as among parents of three. Thus the proportion of mothers encouraged "very much" to have their last child in the hope of having one of the sex opposite that of the previous children is 16 per cent for mothers of two children, 41 per cent for mothers of three, and 41 per cent for mothers of four or more. There is no systematic difference in degree of encouragement by sex of the previous children. However, the data again indicate the presence of rationalization of replies in that the degree of stated encouragement is rather systematically higher among those whose last child was of the sex opposite that of the preceding children than among those whose last child was of the same sex as the preceding children. No relation is found between replies of either wife or husband and fertility-planning status, socio-economic status, and index of economic security (Appendix iii).

Fertility rates for couples having children of only one sex before the birth of the last child, increase with extent to which either the wife or husband was encouraged in having the last child because of "wanting a boy if [they] had only girls" or *vice versa* (Figure 3). This type of relation is less pronounced but still in evidence when the analysis is restricted to planned families having children of only one sex before the birth of the last child. The data are given for the groups of detailed fertility-planning status in Appendix iv.
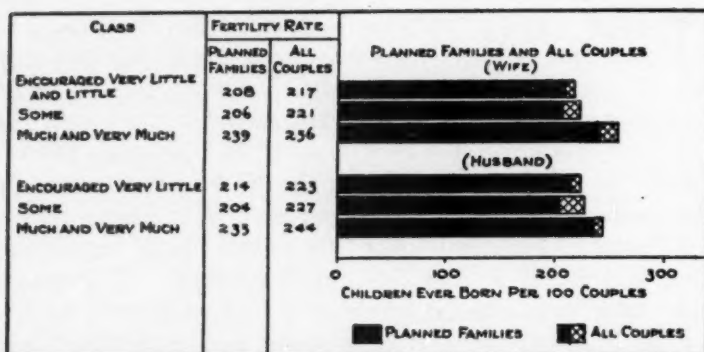
Class	Fertility Rate		Planned Families and All Couples
	Planned Families	All Couples	(Wife)
Encouraged Very Little and Little	208	217	
Some	206	221	
Much and Very Much	239	256	
			(Husband)
Encouraged Very Little	214	223	
Some	204	227	
Much and Very Much	235	244	

0   100   200   300
Children Ever Born Per 100 Couples

■ Planned Families   ⊠ All Couples

Fig. 3. Children ever born per 100 couples having living children of only one sex before conception of last child, by extent to which the wife or husband was encouraged to have the last child by wanting a child of the other sex. Rates shown for all couples and for planned families.

There were 591 couples in the Study who had children of each sex at the time of the interview and were required to reply to the question: "How much are you and your husband [wife] discouraged from having more children [because of] already having children of each sex?" The replies of the wives are distributed as follows: 20 per cent "very much or much," 20 per cent "somewhat," and 60 per cent "little or very little." The replies of the husbands are approximately the same, 16 per cent "very much or much," 22 per cent "somewhat," and 62 per cent "little or very little."

As noted in Table 10, the degree of discouragement in having another child by the fact of "already having a child of each sex" decreases with the total number of children the couples have. This occurs despite the fact that the proportion of unwanted pregnancies increases with order of pregnancy among couples in the Study. It probably simply reflects the ascendance of economic "reasons for discouragement" among the larger families. No systematic difference in degree of discouragment by sex order of the children is revealed by Table 10. Again no systematic relation of these distributions to fertility-planning status, socio-economic status, and index of economic security is found. (Appendix v.)

As noted in Figure 4, fertility rates among all couples having children of both sexes at the time of the interview rise with decreasing discouragement of either the wife or husband from having more children because of already having a child of each
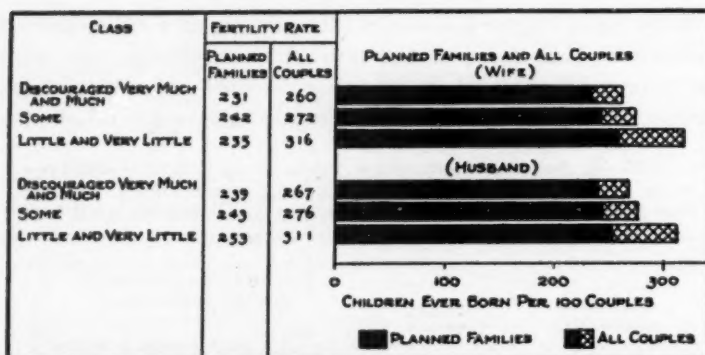
Table 10. Percentage distribution of couples having children of both sexes at the time of interview, by extent to which the wife or husband was discouraged from having another child because they already had children of both sexes, according to number and sex order of children.

ACTUAL SEX OF CHILDREN	NUMBER COUPLES	PER CENT DISTRIBUTION BY EXTENT DISCOURAGED					
		Total	Very Little	Little	Some	Much	Very Much
		REPLIES OF WIFE					
TOTAL	591	100.0	47.9	11.7	20.1	6.1	14.2
Two Children	270	100.1	35.6	11.5	26.7	7.0	19.3
MF	122	100.1	37.7	9.0	23.0	7.4	23.0
FM	148	100.0	33.8	13.5	29.1	7.4	16.2
Three Children	176a	100.0	56.8	13.1	13.1	4.5	12.5
MMF	27	100.0	55.6	3.7	11.1	3.7	25.9
MFM	29	99.9	51.7	13.8	17.2	10.3	6.9
MFF	24	100.1	75.0	4.2	4.2	0.0	16.7
FMM	32	100.0	53.1	12.5	25.0	6.3	3.1
FMF	32	100.1	50.0	21.9	9.4	0.0	18.8
FFM	31	100.1	61.3	19.4	9.7	3.2	6.5
Four or More Children	145	100.0	60.0	10.3	16.6	6.2	6.9
Equal Number by Sex:	52	100.1	55.8	9.6	23.1	5.8	5.8
Majority Male	52	100.0	59.6	15.4	9.6	7.7	7.7
Majority Female	41	100.1	65.9	4.9	17.1	4.9	7.3
		REPLIES OF HUSBAND					
TOTAL	591	100.0	47.7	14.2	21.7	7.1	9.3
Two Children	270	100.0	40.7	12.6	25.9	9.3	11.5
MF	122	100.1	36.1	16.4	23.0	9.8	14.8
FM	148	100.1	43.9	9.5	28.4	8.8	9.5
Three Children	176a	100.0	47.7	19.9	19.3	5.7	7.4
MMF	27	99.9	44.4	14.8	22.2	7.4	11.1
MFM	29	100.0	48.3	13.8	20.7	10.3	6.9
MFF	24	99.9	58.3	20.8	12.5	0.0	8.3
FMM	32	100.1	50.0	21.9	21.9	6.3	0.0
FMF	32	100.0	46.9	21.9	15.6	3.1	2.5
FFM	31	100.0	41.9	25.8	22.6	6.5	3.2
Four or More Children	145	100.0	60.7	10.3	16.6	4.8	7.6
Equal Number by Sex:	52	100.0	61.5	7.7	17.3	5.8	7.7
Majority Male	52	99.9	61.5	11.5	15.4	3.8	7.7
Majority Female	41	100.0	58.5	12.2	17.1	4.9	7.3

a Includes one couple with children of unknown sex order.

CLASS	FERTILITY RATE		PLANNED FAMILIES AND ALL COUPLES (WIFE)
	PLANNED FAMILIES	ALL COUPLES	
DISCOURAGED VERY MUCH AND MUCH	231	260	
SOME	242	272	
LITTLE AND VERY LITTLE	235	316	
			(HUSBAND)
DISCOURAGED VERY MUCH AND MUCH	239	267	
SOME	243	276	
LITTLE AND VERY LITTLE	253	311	

Fig. 4. Children ever born per 100 couples having children of both sexes at the time of interview, by extent to which the wife or husband was discouraged from having another child because they already had children of both sexes. Rates shown for all couples and for planned families.

sex. This pattern holds in classifications based upon replies of either the wife or husband, and for all planned families as well as those of other fertility-planning status (Appendix VI).

The data collected for each successive pregnancy included information from the wife as to whether that pregnancy was wanted by herself and her husband and the reasons for wanting or not wanting it. Frequently multiple reasons were given and the columns on the punch card relating to reasons were multiple punched. Although these columns permit no assessment as to relative importance of the reasons given, they do afford the basis for ascertaining the proportion of wives and husbands giving desire for a child of given sex as a reason for wanting the pregnancy.

Table 11 presents number of wives and husbands giving sex preference as a reason for encouragement in having given pregnancies (Column 5) and the percentages that these numbers form of all couples having a pregnancy of the order considered, all wives or husbands wanting the pregnancy, and all wives or husbands wanting the pregnancy and listing any reason for wanting it. According to these data the desire for a child of given sex is a very infrequent motivation for the first

child but increases in frequency by order of pregnancy through the fourth. This increase is rather striking among couples wanting pregnancies of given order and giving reasons for wanting them.[17]

Fertility Rates in Relation to Preferences Regarding Sex of an Only Child and Only Two Children, by Actual Sex of the First and First Two Children. The preceding data have suggested that preferences regarding the sex of children are important only to a relatively small proportion of couples in the

Table 11. Wives and husbands listing "wanting a boy" or "wanting a girl" as a reason for wanting pregnancies expressed as percentages of all couples having pregnancy of given order, all couples wanting the pregnancy experienced, and all couples giving any reason for wanting the pregnancy.

ORDER OF PREGNANCY	NUMBER COUPLES HAVING THIS PREGNANCY	NUMBER WIVES OR HUSBANDS WANTING THIS PREGNANCY			NUMBER LISTING SEX PREFERENCE AS A REASON FOR WANTING PREGNANCY AS A PERCENTAGE OF NUMBER		
		Total	Giving Any Reason For Wanting	Listing Sex Preference As One Reason	Having This Pregnancy	Wanting This Pregnancy	Giving Any Reason For Wanting
WIVES							
First	1,323	839	806	42	3.2	5.0	5.2
Second	1,014	609	598	115	11.3	18.9	19.2
Third	515	211	203	55	10.7	26.1	27.1
Fourth	248	74	74	25	10.0	33.8	33.8
Fifth	108	21	21	6	5.6	28.6	28.6
HUSBANDS							
First	1,323a	817	750	75	5.7	9.2	10.0
Second	1,014	636	601	163	16.1	25.6	27.1
Third	515a	254	235	72	14.0	28.3	30.6
Fourth	248	85	82	30	12.1	35.3	36.6
Fifth	108	28	26	8	7.4	28.6	30.8

a Includes one unknown with respect to wanting this pregnancy.

[17] As a test of validation, records were examined for 33 wives having only three live births and listing desire for a boy or a girl as a reason for wanting the third pregnancy. Among 27 of these the first two children were either two boys or two girls. Twenty-three of the 27 had listed "boy and girl" as their preference as to sex of children if they could have only two.

sample. In this section an attempt will be made to test more inductively whether such preferences actually do affect the size of family.

As previously indicated, it may be assumed that preferences regarding the sex of children can have opposite types of effect upon fertility. For some couples, or at certain stages of the reproductive history, it may serve to increase the size of family. For other couples, or at other stages of the reproductive history, it may have a deterring effect. Much depends, of course, on whether the parents are successful in having children of the sex desired and on the importance attached to this desire.

In the following data two main categories are established with respect to fulfillment of preference as to sex of children. The "sex preferred" group consists of couples who received with the birth of their first child or first two children the sex or sexes that they stated they would like if they could have only one or two children. The "sex not preferred" group consists of couples who did not receive with the birth of their first child or first two children the sex or sexes preferred in the above provisional sense. For this part of the analysis the somewhat questionable assumption is made that the replies to the suppositional questions on preference as to sex of an only child and only two children represent the actual preferences as to sex of *the first child* and *first two children*. This was necessary, since these two questions are the only ones providing explicit indication of a preference for boys over girls or *vice versa*.

Figure 5 presents fertility rates[18] for three groups of couples with one or more live births: (a) couples whose first child was of the "sex preferred" by the wife if she were to have only one child; (b) couples in which the wife expressed "no preference" as to the sex of an only child; and (c) couples in which the first child was of the "sex not preferred" by the wife if she were to

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[18] The fertility rate, number of live births per 100 couples, is used without further standardization by age of wife since the restriction to couples married during 1927–1929 (with wife under 30 and husband under 40 at marriage) affords a fairly uniform (12–14 years) duration of marriage among the couples in the Study. Eleven cases of adopted children among ten couples are considered as live births in this report.
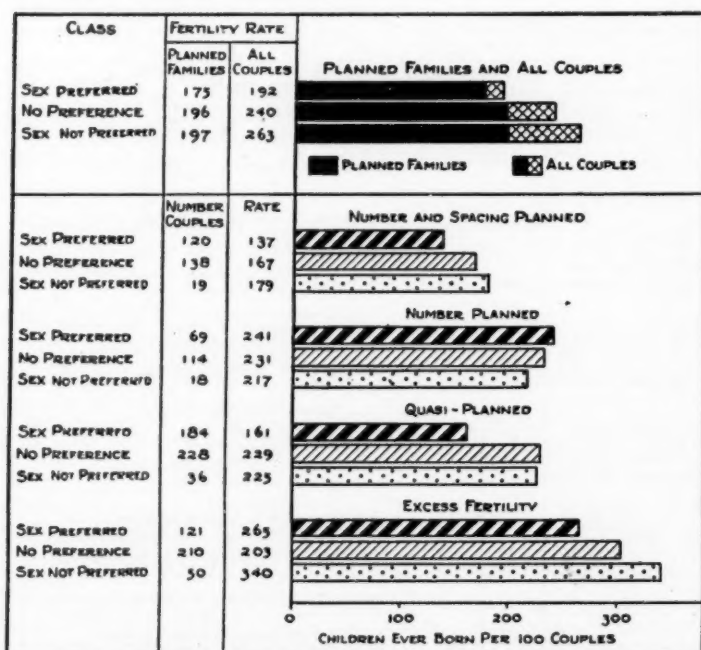
CLASS	FERTILITY RATE		
	PLANNED FAMILIES	ALL COUPLES	PLANNED FAMILIES AND ALL COUPLES
SEX PREFERRED	175	192	
NO PREFERENCE	196	240	
SEX NOT PREFERRED	197	263	
			■ PLANNED FAMILIES ▨ ALL COUPLES
	NUMBER COUPLES	RATE	NUMBER AND SPACING PLANNED
SEX PREFERRED	120	137	
NO PREFERENCE	138	167	
SEX NOT PREFERRED	19	179	
			NUMBER PLANNED
SEX PREFERRED	69	241	
NO PREFERENCE	114	231	
SEX NOT PREFERRED	18	217	
			QUASI - PLANNED
SEX PREFERRED	184	161	
NO PREFERENCE	228	239	
SEX NOT PREFERRED	36	225	
			EXCESS FERTILITY
SEX PREFERRED	121	265	
NO PREFERENCE	210	203	
SEX NOT PREFERRED	50	340	

CHILDREN EVER BORN PER 100 COUPLES
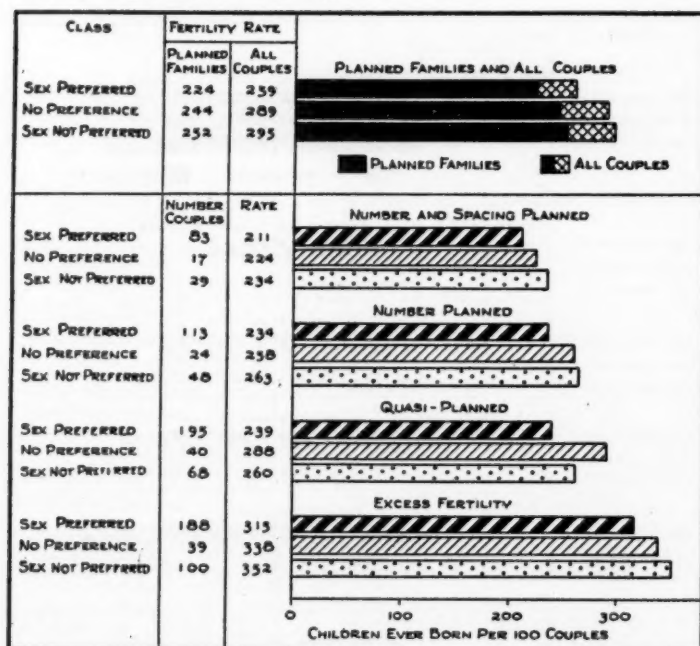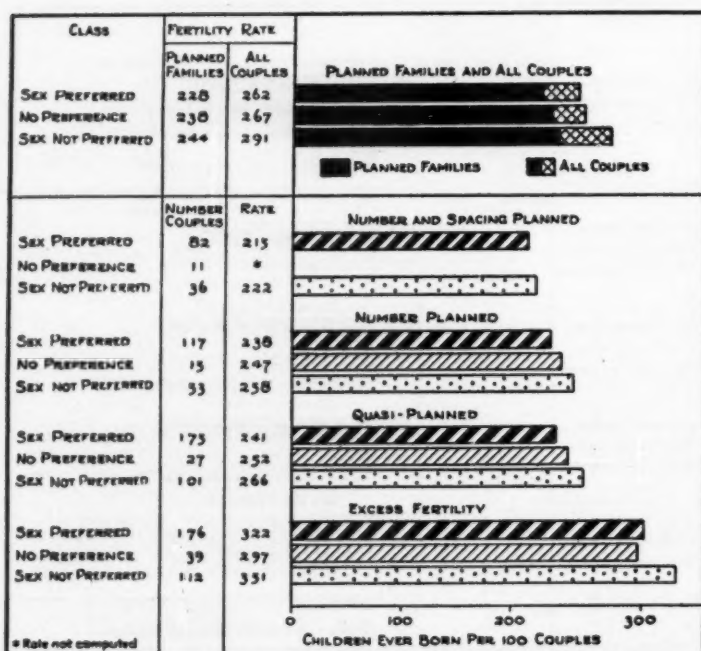
Fig. 5. Children ever born per 100 couples by fertility-planning status and presumed satisfaction of the *wife* as to sex of first child.

have an only child. In the top section of the chart the data are shown for all couples in these categories regardless of fertility-planning status (total length of bars) and also for all "planned families" ("number and spacing planned" and "number planned" combined—represented by solid sections of the bars). In the lower section the data are presented for couples in each of the four fertility-planning groups separately. Figure 6 presents corresponding data based upon preferences of the husband as to sex of an only child. Figures 7 and 8 present analogous data for couples having two or more live births by satisfaction of the wife and husband as to sex of the first two children.

Examination of Figures 5 and 6 indicates that among all couples in the Study having one or more children, the fertility

Class	Fertility Rate		
	Planned Families	All Couples	PLANNED FAMILIES AND ALL COUPLES
Sex Preferred	182	201	
No Preference	180	230	
Sex Not Preferred	230	261	
			■ Planned Families ⊠ All Couples
	Number Couples	Rate	NUMBER AND SPACING PLANNED
Sex Preferred	131	150	
No Preference	120	151	
Sex Not Preferred	26	200	
			NUMBER PLANNED
Sex Preferred	88	230	
No Preference	72	228	
Sex Not Preferred	41	249	
			QUASI-PLANNED
Sex Preferred	135	169	
No Preference	215	217	
Sex Not Preferred	80	221	
			EXCESS FERTILITY
Sex Preferred	146	264	
No Preference	147	315	
Sex Not Preferred	88	321	

0   100   200   300
CHILDREN EVER BORN PER 100 COUPLES

Fig. 6. Children ever born per 100 couples by fertility-planning status and presumed satisfaction of the *husband* as to the sex of first child.

rates are lowest for those whose first child was of the "sex pre-ferred" in an only child, in intermediate position for couples expressing "no preference" as to sex of an only child, and highest for couples whose first child was of the "sex not pre-ferred" in an only child. A similar situation is found with reference to the fertility of couples having two or more chil-dren, subdivided by presumed satisfaction as to sex of the first two children. (Figures 7 and 8.)[19]

In Figures 5 and 6 the above-described patterns are sharper for "all couples" than for "planned families." This arises from exceptions to the pattern presented by the "number planned"

[19] On the basis of standard errors of the distributions by number of live births the following results are found regarding significance of difference between mean number of live births among the "sex preferred" and "sex not preferred" groups

CLASS	FERTILITY RATE		
	PLANNED FAMILIES	ALL COUPLES	**PLANNED FAMILIES AND ALL COUPLES**
SEX PREFERRED	224	259	
NO PREFERENCE	244	289	
SEX NOT PREFERRED	252	295	
			PLANNED FAMILIES ALL COUPLES
	NUMBER COUPLES	RATE	**NUMBER AND SPACING PLANNED**
SEX PREFERRED	83	211	
NO PREFERENCE	17	224	
SEX NOT PREFERRED	29	234	
			NUMBER PLANNED
SEX PREFERRED	113	234	
NO PREFERENCE	24	258	
SEX NOT PREFERRED	48	263	
			QUASI-PLANNED
SEX PREFERRED	195	239	
NO PREFERENCE	40	288	
SEX NOT PREFERRED	68	260	
			EXCESS FERTILITY
SEX PREFERRED	188	315	
NO PREFERENCE	39	338	
SEX NOT PREFERRED	100	352	

Fig. 7. Children ever born per 100 couples by fertility-planning status and presumed satisfaction of the *wife* as to sex of first two children.

couples which in turn may be due partly to sampling error. Aside from this, the fertility differentials described above with respect to satisfaction as to sex of the first child or first two children are rather consistently manifested within each fertility-

(VS = very significant, S = significant, N = not significant by criteria indicated in footnote 15):

"SEX PREFERRED"—"SEX NOT PREFERRED" COMPARISONS AMONG	FIRST CHILD	FIRST TWO CHILDREN
	Significance	
Wives (All Couples)	VS	VS
Wives (Planned Families)	N	S
Husbands (All Couples)	VS	VS
Husbands (Planned Families)	VS	N
Wives and Husbands Jointly Considered (All Couples)	VS	VS

CLASS	FERTILITY RATE		
	PLANNED FAMILIES	ALL COUPLES	PLANNED FAMILIES AND ALL COUPLES
SEX PREFERRED	228	262	
NO PREFERENCE	238	267	
SEX NOT PREFERRED	244	291	
			■ PLANNED FAMILIES ⊠ ALL COUPLES
	NUMBER COUPLES	RATE	NUMBER AND SPACING PLANNED
SEX PREFERRED	82	215	
NO PREFERENCE	11	*	
SEX NOT PREFERRED	36	222	
			NUMBER PLANNED
SEX PREFERRED	117	238	
NO PREFERENCE	15	247	
SEX NOT PREFERRED	53	258	
			QUASI-PLANNED
SEX PREFERRED	175	241	
NO PREFERENCE	27	252	
SEX NOT PREFERRED	101	266	
			EXCESS FERTILITY
SEX PREFERRED	176	322	
NO PREFERENCE	39	297	
SEX NOT PREFERRED	112	331	
* Rate not computed			0 100 200 300 CHILDREN EVER BORN PER 100 COUPLES

Fig. 8. Children ever born per 100 couples by fertility-planning status and presumed satisfaction of the *husband* as to sex of first two children.

planning group. In this connection it will be recalled that the present data failed to indicate differences by fertility-planning status in the frequency or direction of preferences regarding the sex of an only child or only two children (*see* Figure 1 and Appendices I and II).

In Figure 9 the classifications are based upon joint consideration of the wife and husband with respect to satisfaction as to sex of the first child (top section) and first two children (lower section).[20] Comparing first the fertility rates for three groups in each of which the husband and wife gave the same statement as to sex preferred in an only child, we find the lowest

[20] As before, the assumption is made that stated preferences as to sex of an "only child" and "only two children" represent the preferences as to sex of the *first* child and *first two* children, respectively.

CLASS	FERTILITY RATE		PLANNED FAMILIES AND ALL COUPLES
	PLANNED FAMILIES	ALL COUPLES	SATISFACTION AS TO SEX OF FIRST CHILD
W AND H - SEX PREFERRED	170	182	
W AND H - NO PREFERENCE	191	247	
W AND H - SEX NOT PREFERRED	*	297	
W - NO PREFERENCE / H - SEX PREFERRED	195	217	
W - NO PREFERENCE / H - SEX NOT PREFERRED	213	259	
W - SEX PREFERRED / H - NO PREFERENCE	157	181	
W - SEX NOT PREFERRED / H - NO PREFERENCE	*	263	
W - SEX PREFERRED / H - SEX NOT PREFERRED	*	249	
W - SEX NOT PREFERRED / H - SEX PREFERRED	187	241	
			SATISFACTION AS TO SEX OF FIRST TWO CHILDREN
W AND H - SEX PREFERRED	224	257	
W AND H - NO PREFERENCE	*	260	
W AND H - SEX NOT PREFERRED	248	307	
W - NO PREFERENCE / H - SEX PREFERRED	253	307	
W - NO PREFERENCE / H - SEX NOT PREFERRED	247	285	
W - SEX PREFERRED / H - NO PREFERENCE	*	269	
W - SEX NOT PREFERRED / H - NO PREFERENCE	*	270	
W - SEX PREFERRED / H - SEX NOT PREFERRED	232	263	
W - SEX NOT PREFERRED / H - SEX PREFERRED	239	271	

0   100   200   300
CHILDREN EVER BORN PER 100 COUPLES

PLANNED FAMILIES   ALL COUPLES

* Rate not computed

Fig. 9. Children ever born per 100 couples by presumed satisfaction of the *wife and husband* as to sex of first child and first two children. Rates shown for all couples and for planned families.

fertility rate (182) for couples having a first child of the "sex preferred" and highest fertility rate (297) for those whose first child was of the "sex not preferred." Again the rate for couples expressing "no preference" is in intermediate position. These data afford no basis for saying that one spouse's preference as to sex of children has more bearing on size of family than the other spouse's preference.[21]

Although Figures 5–9 collectively seem to give fairly sub-

[21] The numbers on which the fertility rates for all couples are based may be

stantial support to the hypothesis that preferences regarding the sex of children affect size of family, an underlying limitation is the possibility of selection inherent in the categories established. We have previously noted that the tendency for rationalization of replies as to sex preference of an only child and of only two children was especially strong among couples actually having only one child or only two children. Consequently the "sex preferred" categories are overweighted with small families by virtue of this type of selection. To eliminate the one or two-child families from the analyses, of course, also tends to eliminate couples who actually restricted family size because they had children of the sex wanted. Nevertheless, it is of interest to note that the fertility rates for all couples with *two or more* children are as follows for three groups established on the basis of wife's preference as to sex of an only child in relation to actual sex of the first child: first child of "sex preferred" 271; "no preference" as to sex of child 268; and first child of "sex not preferred" 295.

Another finding relevant to the interpretation of the low fertility of couples whose first or first two children were of the "sex preferred" is that concerning number of children wanted by the wife and husband at marriage. Figures 10-12 repeat fertility rates for some of the categories of couples presented in Figures 5-9 and include in addition "number of children wanted at marriage per 100 couples." In the first place, it will be noted that the professed number of children wanted at

found in Figure 12. The numbers in specified groups of planned families are as follows:

CLASS	SATISFACTION AS TO SEX OF	
	First Child	First Two Children
W. and H. Sex Preferred	105	162
W. and H. No Preference	116	50
W. and H. Sex Not Preferred	5	212
W. No Pref.—H. Sex Pref.	91	19
W. No Pref.—H. Sex not Pref.	45	17
W. Sex Pref.—H. No Pref.	67	12
W. Sex Pref.—H. Sex Pref.	23	5

CLASS	NUMBER COUPLES	RATE	
			ALL COUPLES (WIFE'S REPLY)
Sex Preferred	494 / 488	193 / 229	
No Preference	690 / 676	240 / 251	
Sex Not Preferred	123 / 122	263 / 253	
			(HUSBAND'S REPLY)
Sex Preferred	320 / 300	201 / 211	
No Preference	515 / 515	229 / 227	
Sex Not Preferred	235 / 234	261 / 245	
			PLANNED FAMILIES (WIFE'S REPLY)
Sex Preferred	188 / 189	175 / 246	
No Preference	252 / 245	196 / 244	
Sex Not Preferred	37 / 37	197 / 268	
			(HUSBAND'S REPLY)
Sex Preferred	219 / 208	182 / 225	
No Preference	122 / 104	180 / 213	
Sex Not Preferred	67 / 67	230 / 264	

CHILDREN EVER BORN AND CHILDREN WANTED AT MARRIAGE PER 100 COUPLES

▮ CHILDREN EVER BORN
▨ CHILDREN WANTED AT MARRIAGE

Fig. 10. Children ever born and children wanted at marriage per 100 couples, by presumed satisfaction of the wife or husband as to sex of first child.

marriage bears much the same relation as that of fertility rates to satisfaction as to sex of the first or first two children. This suggests strongly that the replies regarding number of children wanted at marriage may be colored by number of actual children just as the replies regarding sex preference are conditioned by actual sex of the children. The writers know of no reason why couples whose first child or first two children were not of the sex preferred should constitute a group actually wanting more children *at the time of marriage* than couples whose preferences were fulfilled.

On the other hand, the fact that there are differences between actual fertility rates and number of children wanted at marriage is evidence that some of the couples did discriminate between number of children originally wanted and number that they actually had. Furthermore, some of these differences follow a pattern that suggests a real bearing of preferences regard-
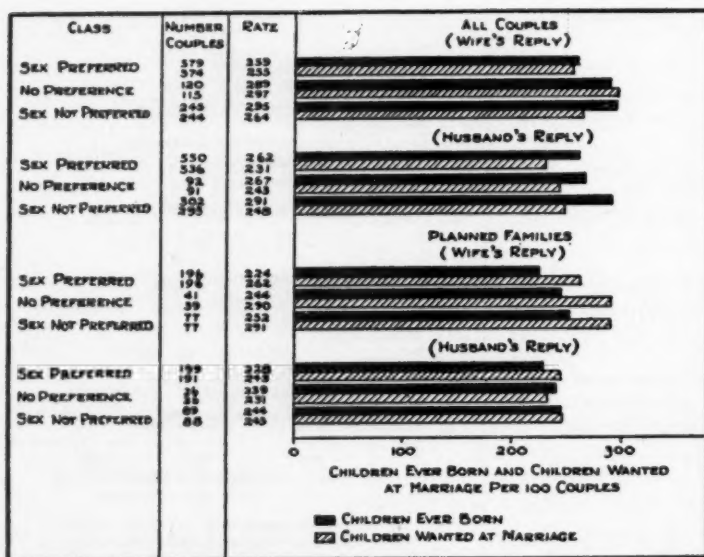
Fig. 11. Children ever born and children wanted at marriage per 100 couples, by presumed satisfaction of the wife or husband as to sex of first two children.

ing sex of children on fertility. It will be noted that among all couples classified on the basis of separate or joint consideration of the wives and husbands with respect to satisfaction as to sex of the first child (top sections Figures 10 and 12), the couples whose first child was of the "sex preferred" had fewer children on the average than they said they wanted at the time of marriage. The couples whose first child was of the "sex not preferred," in contrast, had more children on the average than they said they wanted at marriage. This type of contrast, however, does not appear among the "planned families" considered separately in the lower section of Figure 10; among these, actual fertility rates are universally and substantially below the numbers of children wanted at marriage. Furthermore, the contrast fails to appear in the classifications based upon satisfaction as to sex of the first two children.

As previously noted, about 47 per cent of the 1,309 wives

Class	Number Couples	Rate	All Couples — Satisfaction as to Sex of First Child
W and H - Sex Preferred	265 / 260	182 / 217	
W and H - No Preference	351 / 344	247 / 250	
W and H - Sex Not Preferred	30 / 30	297 / 220	
W - No Preference / H - Sex Preferred	211 / 204	217 / 253	
W - No Preference / H - Sex Not Preferred	128 / 128	237 / 248	
W - Sex Preferred / H - No Preference	187 / 52	181 / 239	
W - Sex Not Preferred / H - No Preference	90 / 49	263 / 276	
W - Sex Preferred / H - Sex Not Preferred	?? / 72	249 / 247	
W - Sex Not Preferred / H - Sex Preferred	?? / 42	241 / 252	
			Satisfaction as to Sex of First Two Children
W and H - Sex Preferred	452 / 448	237 / 260	
W and H - No Preference	20 / 18	260 / 4	
W and H - Sex Not Preferred	164 / 153	307 / 264	
W - No Preference / H - Sex Preferred	46 / 44	302 / 275	
W - No Preference / H - Sex Not Preferred	54 / 53	265 / 319	
W - Sex Preferred / H - No Preference	42 / 42	269 / 269	
W - Sex Not Preferred / H - No Preference	50 / 30	270 / 237	
W - Sex Preferred / H - Sex Not Preferred	84 / 84	263 / 223	
W - Sex Not Preferred / H - Sex Preferred	51 / 51	271 / 269	

0   100   200   300
Children Ever Born and Children Wanted at Marriage Per 100 Couples

■ Children Ever Born
▨ Children Wanted by Wife at Marriage

* Rate not computed

Fig. 12. Children ever born and children wanted at marriage per 100 couples, by presumed satisfaction of the couple as to sex of first child and first two children.

and 58 per cent of the husbands with one or more live births indicated that they would have a preference regarding the sex of an only child. Had this preference been recorded before the birth of the first child one would expect it to be the same as the actual sex of the first child in approximately 50 per cent of the cases. Some measure of the influence of the actual sex of the first child on the stated preferences is indicated by the fact that 80 per cent of the wives' preferences and 69 per cent of the husbands' preferences corrsponded with the actual sex of the first child.

Table 12 presents fertility rates in relation to proportionate importance of certain subdivisions of couples whose first child was and was not of the sex that the wife or husband would prefer if they could have only one child. The classifications based upon fulfillment of the wife's preference are presented in Figure 13. First of all, it will be noted that nearly half (46 per cent) of the wives whose first child was of the "sex preferred" had only one child. In contrast, only 16 per cent of the wives whose first child was of the "sex not preferred" had only one child. Substantially the same type of difference (39 per cent as compared with 17 per cent) is observed in the classifications based upon the fulfillment of the husbands' preferences (Table 12). Likewise, among wives having two or more children and whose first two children were of the sex preferred, 66 per cent had only two children. In contrast, only 45 per cent of those whose first two children were of the "sex not preferred" had only two children (Figure 14). The corresponding percentages relating to

Table 12. Children ever born per 100 couples in specified subdivisions of groups whose first child presumably was and was not of the sex preferred by the wife or husband. Rates shown in relation to proportionate importance of the subdivisions within each group.[1]

SATISFACTION AS TO SEX OF FIRST CHILD	WIFE			HUSBAND		
	Number of Couples	Per Cent	Fertility Rate	Number of Couples	Per Cent	Fertility Rate
Sex Preferred						
TOTAL	494	100.0	192	520	100.0	201
Had Only One Child	229	46.4	100	204	39.2	100
Had More Than One Child	265	53.6	271	316	60.8	266
Sex Not Preferred						
TOTAL	123	100.1	263	235	100.0	261
Had Only One Child	20	16.3	100	41	17.4	100
Last Child of Sex Preferred	37	30.1	227	74	31.5	241
Had Children After Received Sex Preferred	36	29.3	400	62	26.4	432
Never Had Child of Sex Preferred	30	24.4	253	58	24.7	216

[1] Subdivisions made on the basis of sex-order of live births and adoptions in relation to preference as to sex of an only child.

Class	Rate	Per Cent	
			Sex Preferred
Had Only One Child	100	46.4	
Had More Than One Child	271	53.6	
			Sex Not Preferred
Had Only One Child	100	16.3	
Last Child of Sex Preferred	227	30.1	
Had Children After Received Sex Preferred	400	29.3	
Never Had Child of Sex Preferred	253	24.4	

CHILDREN EVER BORN PER 100 COUPLES
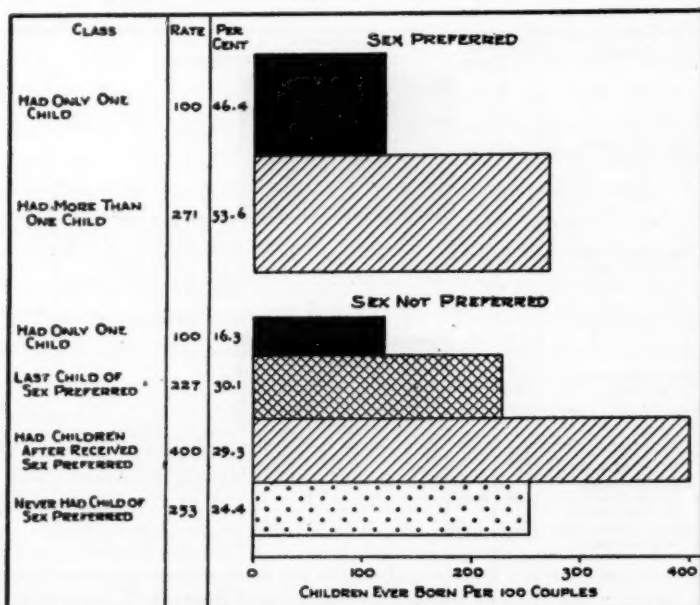
Fig. 13. Children ever born per 100 couples in specified subdivisions of groups whose first child presumably was and was not of the sex preferred by the *wife*. (The proportionate importance of the subdivisions within each group is indicated on the vertical scale. *See* Table 12.)

fulfillment of the husbands' preferences are 63 and 48 respectively (Table 13). To some extent the above contrasts may reflect a greater readiness to have no more children if the first child or first two children are of the "sex preferred" than if they are of the "sex not preferred." In large measure, however, the contrasts doubtless arise simply from the selective factors previously described, i.e., the undue selection of one-child and two-child families into the "sex preferred" rather than "sex not preferred" groups because of the strong tendency for these couples to reply to the suppositional questions in terms of their actual situation.[22]

[22] It is possible that many of these actually had no strong preferences as to sex of children but simply thought in terms of the actual children that they had. Thus, parents of one child might react immediately with the thought that if they could
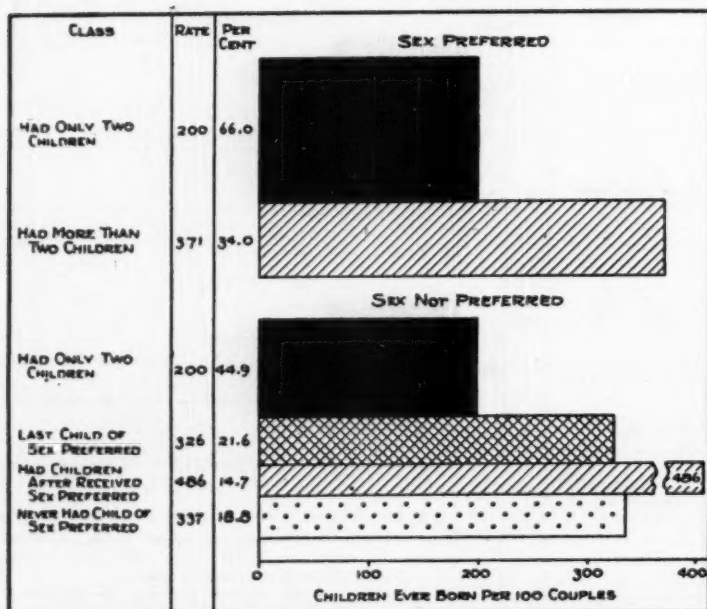
Fig. 14. Children ever born per 100 couples in specified subdivisions of groups whose first two children presumably were and were not of the sexes preferred by the *wife*. (The proportionate importance of the subdivisions within each group is indicated on the vertical scale. *See* Table 13.)

Perhaps the couples whose first child and first two children are not of the sex preferred, continue to have children until they do have one of the preferred sex and then have no more, constitute the prototype of those whose fertility is strongly affected by preference regarding sex of children. These groups are labeled "Last Child of Sex Preferred" in Figures 13 and 14 and Tables 12 and 13. There were 37 wives whose first child was not of the "sex preferred" if they could have an only child and who continued to have children until but not after they had one of the sex preferred. This group constitutes about 30 per cent of all wives whose first child was of the "sex not pre-

have only one child they still would want "John" or "Jane" and enter the appropriate sex in reply to the question. Likewise, parents of two children might think that they certainly would want John and Mary, John and Harry, or Jane and Susie if they could have only two children.

ferred" but less than 3 per cent of all wives with children. The 74 husbands in the similar category constitute about 32 per cent of all husbands whose first child was of the "sex not preferred" but less than 6 per cent of all husbands with children. Wives and husbands in this category exhibit fertility rates (227 and 241 live births per 100 couples respectively) that are higher than those for wives and husbands whose first child was of the "sex preferred" (192 and 201) but lower than those for the total group of wives or husbands whose first child was of the "sex not preferred" (263 and 261). The distribution of the 37 wives and 74 husbands by sex order of children born (Appendix VII), points up (a) the predominance of two-child families in these categories, and (b) the formerly-noted stronger preference for a son among husbands than among wives.

The two remaining categories represented in Figure 13 are

Table 13. Children ever born per 100 couples in specified subdivisions of groups whose first two children presumably were and were not of the sexes preferred by the wife or husband. Rates shown in relation to proportionate importance of the subdivisions within each group.[1]

SATISFACTION AS TO SEX OF FIRST TWO CHILDREN	WIFE			HUSBAND		
	Number of Couples	Per Cent	Fertility Rate	Number of Couples	Per Cent	Fertility Rate
Sex Preferred						
TOTAL	579	100.0	259	550	100.0	262
Had Only Two Children	382	66.0	200	347	63.1	200
Had More Than Two Children	197	34.0	371	203	36.9	367
Sex Not Preferred						
TOTAL	245	100.0	295	302	100.0	291
Had Only Two Children	110	44.9	200	144	47.7	200
Last Child of Sex Preferred	53	21.6	326	58	19.2	324
Had Children After Received Sex Preferred	36	14.7	486	48	15.9	471
Never Had Child of Sex Preferred	46	18.8	337	52	17.2	340

[1] Subdivisions made on the basis of sex-order of live births and adoptions in relation to preference as to sex of only two children.

composed of wives whose fertility presumably was not sub-
stantially affected by preference as to sex of children, although
the first child was of the "sex not preferred." The first of these
is labeled "Had Children After Received Sex Preferred." This
group, constituting 29 per cent of the wives whose first child
was of the "sex not preferred" and approximately 3 per cent
of all fertile couples, exhibited a higher fertility rate than that
of any other group represented in Figure 13. Perhaps it would
be more accurate to say that by definition this group tends to
be selective of couples of high fertility. The last group of wives,
labeled "Never Had Child of Sex Preferred" includes about 24
per cent of all wives whose first child was of the "sex not pre-
ferred" and only about 2 per cent of all wives with children.
This group exhibits a fertility rate of 253 which is not much
higher than that (227) for the group of wives labeled "Last
Child of Sex Preferred." Furthermore, since this group is by
definition composed of wives with at least two children each, it
is apparent that only a small proportion of the wives within
this small group were willing to "keep trying" for a child of
given sex beyond the second or third child. Essentially the
same situations as those described above are also found in the
data relating to husband's satisfaction as to sex of the first child
(Table 12) and in those relating to wife's or husband's satisfac-
tion as to sex of the first two children (Figure 14, Table 13).[23]

Summary

In broad summary, the data from the Indianapolis Study
support the hypothesis in the categorical form "preferences re-
garding the sex of children affect size of family" but they also
indicate that this factor is not a *major* determinant of family
size except among a small proportion of the couples.

[23] All of the couples represented in Figure 14 had two or more children. The two
major categories, as before, are based upon joint consideration of preferences as to
sex of children if the couple could have only two children and actual sex of the
first two children. The subdivision labeled "Last Child of Sex Preferred" is com-
posed of couples whose first two children were not of the sexes preferred and who
continued to have children until, but not after, the sexes preferred were represented
in the family. The actual distributions of wives and husbands in this category, by
sex order of children, are given in the lower part of Appendix VII.

Approximately 53 per cent of the wives and 42 per cent of the husbands stated that they would have no preference as to sex of an only child. Among the remaining wives the proportion of preferences for a girl is slightly higher than that for a boy. Among the remaining husbands the preferences run heavily toward a son as an only child. Approximately two-thirds of the wives and three-fourths of the husbands stated that if they could have only two children they would prefer a *girl and a boy*.

The replies to the suppositional questions regarding preference as to sex of an only child and sexes of only two children tend to correspond with actual sex of first child and first two children and this is particularly strong among parents of only one child in the first instance and among parents of only two children in the second instance. Although this type of rationalization limits the value of the data for certain uses to which they have been put, it also points up the strong tendency for parents to be satisfied with sex of the children that they have. This tendency itself probably reduces the potential bearing of sex preferences in children on fertility.

Among 693 couples having living children of only one sex at the time of conception of the last child, about 10 per cent of the wives and husbands checked "wanting a girl if had only boys, or a boy if had only girls" as the reason of first importance in being encouraged to have the last pregnancy. About 33 per cent of the wives and 30 per cent of the husbands checked this reason as the one of first, second, or third importance.

Among the same group of couples about 34 per cent of the wives and 32 per cent of the husbands indicated in reply to another question that they had been "very much" or "much" encouraged to have their last child by reason of "wanting a girl if had only boys, or a boy if had only girls." The proportion giving these replies increased with *number* of children of similar sex prior to conception of last child.

Among 591 couples having a child of each sex at the time of the interview, 11 per cent of the wives and 14 per cent of the

husbands checked "already having a child of each sex" as the reason of first importance in not wanting another child. Forty-nine per cent of the wives and 48 per cent of the husbands listed this as the reason of first, second, or third importance. However, in reply to another question, only 20 per cent of the wives and 16 per cent of the husbands stated that "already having a child of each sex" discouraged them "very much" or "much" from having more children. The proportion giving these replies varied inversely with number of live births.

Under the assumption that the preferences regarding sex of an only child and sexes of only two children represent, respectively, the preferences regarding the first child and first two children, it may be stated that fertility rates are lowest for couples having sex preference fulfilled in the first child and first two children, in intermediate position for those expressing no preference, and highest for those not having sex preference fulfilled in the first child or first two children. Although these patterns may reflect some real relationship of sex preferences to fertility, there is evidence that they may arise in considerable part from selective factors. Couples actually having only one child or two children tend to be selected unduly into the group having sex preferences "fulfilled" because these couples especially tended to state preferences in terms of actual sex of their children.

Whatever may be the relative importance of selective and determinative factors in the high proportion of one and two-child families among couples whose preferences as to sex of an only child and only two children correspond with actual sex of the children, one feels rather safe in assuming that preferences regarding sex of children is an important determinant of fertility among couples whose first child or first two children were not of the sex preferred, who continued to have children until they did have one or two of the sex or sexes preferred, and then had no more. Three per cent of all couples with children fall into this category on the basis of the wife's preference and 6 per cent on the basis of the husband's preference with respect

to sex of an only child. Six per cent of all couples with two or more children fall into this category on the basis of wife's or husband's preference with respect to sexes of only two children.

Finally, despite their inadequacies, the present data do provide the basis for suspecting as untenable any assumption that preferences for sons are generally more important than preferences for daughters in American urban culture. They provide no basis for Sanford Winston's hypothesis that preferences for males are sufficiently important to result in higher sex ratios at birth for the country as a whole as contraceptive practice becomes more widespread. In fact the sex ratios among annual births since 1915 provide no suggestion of such a trend although there has been a substantial increase in the control of fertility since that time. According to the present data, sex preferences in children are by no means unilateral and among both wives and husbands the desire for at least one child of each sex appears to be the most common form of sex preference. Furthermore, the data suggest that most couples tend to be satisfied with the sex of the children they have and that sex preference is an important determinant of fertility among relatively few couples.

Appendix I. Percentage distribution of wives and husbands by stated preference as to sex of an only child, subdivided by fertility-planning status, index of socio-economic status and index of economic security.

CLASS	TOTAL		PER CENT OF WIVES REPLYING			PER CENT OF HUSBANDS REPLYING		
	Number	Per Cent	No Pref.	A Girl	A Boy	No Pref.	A Girl	A Boy
TOTAL	1,309a	100	52.8	25.4	21.8	42.3	9.9	47.7
Planning Status								
Number and Spacing Planned	277	100	49.8	24.5	25.6	43.3	7.9	48.7
Number Planned	201	100	56.7	24.9	18.4	35.8	9.5	54.7
Quasi-Planned	450	100	50.9	29.7	19.4	47.8	10.7	41.6
Excess Fertility	381	100	55.1	21.3	23.6	38.6	10.8	50.7
Index of SES								
0–19 (High)	201	100	46.8	27.9	25.4	41.3	10.0	48.8
20–29	203	100	52.7	29.6	17.7	36.5	10.3	53.2
30–39	291	100	53.3	25.8	21.0	45.7	11.0	43.3
40–49	372a	100	53.2	26.2	20.2	46.5	7.5	46.0
50+ (Low)	242	100	56.2	18.2	25.6	37.6	12.0	50.4
Index of Economic Security								
90+ (High)	107	100	59.8	25.2	15.0	43.0	0.9	56.1
80–89	242	100	49.6	31.4	19.0	49.2	9.9	40.9
70–79	329	100	53.8	22.5	23.7	44.4	8.5	47.1
60–69	296	100	56.4	19.9	23.6	39.9	11.5	48.6
50–59	206	100	49.5	26.0	24.5	43.7	11.7	44.7
40–49	96	100	46.9	29.2	24.0	24.0	12.5	63.5
Under 40 (Low)	33	100	48.5	45.5	6.1	36.4	21.2	42.4

a Two unknowns as to sex preference for wife included.

Appendix II. Percentage distribution of wives and husbands by stated preference as to sex of only two children, subdivided by fertility-planning status, index of socio-economic status, and index of economic security.

CLASS	TOTAL		PER CENT OF WIVES REPLYING				PER CENT OF HUSBANDS REPLYING			
	Number	Per Cent	No Pref.	A Girl and a Boy	Two Girls	Two Boys	No Pref.	A Girl and a Boy	Two Girls	Two Boys
TOTAL	1,309	100	12.0	69.2	10.1	8.7	9.0	79.2	3.4	8.3
Planning Status										
Number and Spacing Planned	277	100	13.0	65.3	11.9	9.7	9.0	76.9	5.8	8.3
Number Planned	201	100	11.9	71.6	9.0	7.5	7.5	76.6	5.5	10.4
Quasi-Planned	450	100	12.4	68.2	10.0	9.3	8.2	84.4	1.6	5.8
Excess Fertility	381	100	10.8	71.9	9.4	7.9	10.8	76.1	2.9	10.2
Index of SES										
0-19 (High)	201	100	10.9	74.1	9.5	5.5	7.5	82.6	4.0	6.0
20-29	203	100	10.8	70.0	12.8	6.4	4.4	81.8	5.4	8.4
30-39	291	100	14.1	67.4	8.6	10.0	14.8	73.2	3.4	8.6
40-49	372	100	11.8	64.5	11.3	12.4	8.9	79.3	2.2	9.7
50 + (Low)	242	100	11.6	74.0	8.3	6.2	7.4	81.4	3.3	7.9
Index of Economic Security										
90 + (High)	107	100	12.1	76.6	7.5	3.7	7.5	86.9	0.0	5.6
80-89	242	100	5.4	76.4	11.6	6.6	7.0	81.0	2.9	9.1
70-79	329	100	15.8	64.1	8.8	11.2	13.7	73.3	3.6	9.4
60-69	296	100	15.2	67.2	11.5	6.1	9.1	79.4	3.7	7.8
50-59	206	100	9.2	70.9	9.7	10.2	4.9	83.0	5.3	6.8
40-49	96	100	12.5	60.4	11.5	15.6	5.2	81.3	2.1	11.5
Under 40 (Low)	33	100	9.1	75.8	6.1	9.1	18.2	69.7	6.1	6.1

Appendix III. Percentage distribution of couples having living children of only one sex before conception of the last child, by extent to which this condition encouraged the wife and husband to have the last child, according to fertility-planning status, index of socio-economic status, and index of economic security of the couple.

| | WIFE'S STATEMENT | | | | | HUSBAND'S STATEMENT | | | | |
| | NUMBER OF COUPLES | Per Cent Distribution by Extent Encouraged | | | | NUMBER OF COUPLES | Per Cent Distribution by Extent Encouraged | | | |
CLASS		Total	Very Little and Little	Some	Much and Very Much		Total	Very Little and Little	Some	Much and Very Much
TOTAL	643ª	100.0	44.6	21.3	34.1	655ª	99.9	45.6	22.4	31.9
Fertility-Planning Status										
Number and Spacing Planned	103	100.0	49.5	21.4	29.1	110	100.1	46.4	26.4	27.8
Number Planned	143	100.1	43.4	19.6	37.1	148	100.0	42.6	27.7	29.7
Quasi-Planned	228	100.0	46.5	22.4	31.1	226	100.0	46.0	20.4	33.6
Excess Fertility	169	100.0	40.2	21.3	38.5	171	100.0	47.4	18.1	34.5
Index of S.E.S.										
0–19 (High)	102	100.1	36.3	26.5	37.3	104	100.1	43.3	21.2	35.6
20–29	94	100.0	58.5	9.6	31.9	98	100.0	52.0	23.5	24.5
30–39	150	100.0	46.7	24.0	29.3	154	100.0	44.2	21.4	34.4
40–49	190	100.0	44.7	21.1	34.2	190	100.0	47.9	23.2	28.9
50+ (Low)	107	100.1	37.4	23.4	39.3	109	100.0	40.4	22.9	36.7
Index of Economic Security										
90+ (High)	62	100.0	37.1	21.0	41.9	64	100.0	53.1	12.5	34.4
80–89	104	99.9	44.2	19.2	36.5	108	100.0	46.3	27.8	25.9
70–79	175	100.0	50.9	24.0	25.1	172	100.0	46.5	16.9	36.6
60–69	135	100.0	41.5	23.7	34.8	139	99.9	38.1	30.9	30.9
50–59	109	100.0	44.0	15.6	40.4	111	99.9	46.8	25.2	27.9
40–49	46	100.0	41.3	21.7	37.0	49	100.0	46.9	18.4	34.7
Under 40 (Low)	12	*				12	*			

ª Question asked of 693 couples having children of only one sex before conception of last child, but 50 wives and 38 husbands did not reply.
* Percentage not computed.

Appendix IV. Children ever born per 100 couples who had children of only one sex before conception of the last child, by fertility-planning status and by extent wife and husband were encouraged to have the last child by desire for a child of the opposite sex.

CLASS	WIFE		HUSBAND	
	Number Couples	Rate	Number Couples	Rate
TOTAL a	643b	231	655c	231
Encouraged Very Little and Little	287	217	299	223
Some	137	221	147	227
Much and Very Much	219	256	209	244
Planned Families				
Encouraged Very Little and Little	113	208	114	214
Some	50	206	70	204
Much and Very Much	83	239	74	235
Number and Spacing Planned				
Encouraged Very Little and Little	51	200	51	206
Some	22	191	29	200
Much and Very Much	30	233	30	217
Number Planned				
Encouraged Very Little and Little	62	215	63	221
Some	28	218	41	207
Much and Very Much	53	242	44	248
Quasi-Planned				
Encouraged Very Little and Little	106	213	104	218
Some	51	218	46	226
Much and Very Much	71	246	76	234
Excess Fertility				
Encouraged Very Little and Little	68	240	81	242
Some	36	247	31	277
Much and Very Much	65	288	59	269

a Question asked of 693 couples who had children of only one sex before birth of last child.
b Fifty unknown replies excluded.
c Thirty-eight unknown replies excluded.

Appendix v. Percentage distribution of couples having children of both sexes at the time of interview, by statements of wives and husbands on extent of discouragement from having more children because of already having children of both sexes, according to fertility-planning status, index of socio-economic status, and index of economic security of the couple.

CLASS	TOTAL		PER CENT DISTRIBUTION BY EXTENT DISCOURAGED					
			Wife's Statement			Husband's Statement		
	Number	Per Cent	Very Much and Much	Some	Little and Very Little	Very Much and Much	Some	Little and Very Little
TOTAL	591	100	20.3	20.1	59.6	16.4	21.7	61.9
Fertility-Planning Status								
Number and Spacing Planned	60	100	21.7	25.0	53.3	26.7	25.0	48.3
Number Planned	108	100	24.1	10.2	65.7	15.7	25.0	59.3
Quasi-Planned	187	100	23.0	23.0	54.0	15.5	21.9	62.6
Excess Fertility	236	100	16.1	21.2	62.7	14.8	19.1	66.1
Index of S.E.S.								
0–19 (High)	83	100	19.3	22.9	57.8	31.3	24.1	44.6
20–29	84	100	41.7	13.1	45.2	14.3	34.5	51.2
30–39	92	100	12.0	8.7	79.3	14.1	27.2	58.7
40–49	171	100	22.2	24.6	53.2	14.0	18.1	67.8
50 + (Low)	161	100	12.4	24.2	63.4	13.7	14.3	72.0
Index of Economic Security								
90 + (High)	50	100	20.0	20.0	60.0	22.0	18.0	60.0
80–89	108	100	25.0	13.0	62.0	14.8	30.6	54.6
70–79	136	100	16.9	21.3	61.8	16.9	20.6	62.5
60–69	131	100	13.7	25.2	61.1	11.5	21.4	67.2
50–59	106	100	26.4	20.8	52.8	20.8	18.9	60.4
Under 50 (Low)	60	100	23.3	18.3	58.3	16.7	16.7	66.7

Appendix VI. Number of children ever born per 100 couples having children of both sexes at time of interview, by extent wife and husband were disinclined to have more children for this reason.

CLASS	WIFE		HUSBAND	
	Number Couples	Rate	Number Couples	Rate
TOTAL	591	296	591	296
Discouraged Very Much and Much	120	260	97	267
Some	119	272	128	276
Little and Very Little	352	316	366	311
Planned Families				
Discouraged Very Much and Much	39	231	33	239
Some	26	242	42	243
Little and Very Little	103	255	93	253
Number and Spacing Planned				
Discouraged Very Much and Much	13	*	16	*
Some	15	*	15	*
Little and Very Little	32	222	29	217
Number Planned				
Discouraged Very Much and Much	26	235	17	*
Some	11	*	27	241
Little and Very Little	71	270	64	269
Quasi-Planned				
Discouraged Very Much and Much	43	228	29	238
Some	43	242	41	246
Little and Very Little	101	290	117	278
Excess Fertility				
Discouraged Very Much and Much	38	326	35	317
Some	50	314	45	333
Little and Very Little	148	376	156	370

* Rate not computed.

Appendix VII. Sex order of children among couples whose first or first two children were not of the sex presumably preferred by the wife or husband, and who continued to have children until but not after the presumed preferences were fulfilled.

NUMBER AND SEX ORDER OF CHILDREN	WIFE		HUSBAND	
	Number	Per Cent	Number	Per Cent
PREFERENCE AS TO SEX OF ONLY CHILD				
TOTAL	37	99.9	74	100.2
MF	17	45.9	4	5.4
FM	12	32.4	48	64.9
MMF	3	8.1	1	1.4
FFM	4	10.8	14	18.9
FFFM	0	0.0	5	6.8
MMMF	0	0.0	1	1.4
FFFFM	1	2.7	1	1.4
PREFERENCE AS TO SEX OF ONLY TWO CHILDREN				
TOTAL	53	100.1	58	99.8
MFF	1	1.9	1	1.7
MMF	22	41.5	22	37.9
FMM	1	1.9	0	0.0
FFM	19	35.8	22	37.9
MMMF	3	5.7	5	8.6
FMFM	0	0.0	1	1.7
FFMM	0	0.0	1	1.7
FFFM	2	3.8	5	8.6
FMMF	1	1.9	0	0.0
MMMFF	1	1.9	0	0.0
FFFMM	1	1.9	0	0.0
FFFFM	2	3.8	1	1.7

ANNOTATIONS

FAMILY UTILIZATION OF HEALTH RESOURCES IN RURAL AREAS[1]

DATA on the extent to which families in two rural counties in Upper New York State made use of available medical care in the year ending September 30, 1949, are presented in an article entitled "Family Utilization of Health Resources in Rural Areas." The data were collected in a study made by the Department of Rural Sociology, Cornell University, in cooperation with the Bureau of Agricultural Economics, United States Department of Agriculture. The study was developed in close consultation with the New York State Department of Health.

The authors were interested in discovering how extensively families in rural areas utilized the provisions for medical care which were available to them, although facilities in these areas were acknowledged to be inferior in number to those in urban areas. They also sought to determine to what extent the availability of medical care affects the use of medical services.

The plan was to choose two rural counties in New York State with similar social, economic, and agricultural characteristics, but with different medical resources. Cortland and Oswego counties were chosen. They are both in the dairy belt of New York State and equidistant from the nearest metropolitan center, Syracuse. The proportion of the total population which was rural was approximately the same for the two counties. Cortland, however, was considered to have more medical facilities when number of physicians, number of nurses, number of specialists, number of hospital beds etc. were com-

[1] Larson, Olaf F.; Hay, Donald, G.; Levy, Walter C.; and Mosher, William E.: Family Utilization of Health Resources in Rural Areas. *New York State Journal of Medicine*, February 1, 1951, 51, No. 4, pp. 335–340.

pared to those of Oswego on a per 1,000 population basis. In addition, Cortland had its own Health Department, while Oswego shared its District Health Office with two other counties.

The sample consisted of 250 rural families in Cortland and 283 rural families in Oswego. There were 950 persons in the 250 families in Cortland and 966 persons in the 283 families in Oswego. The families in the two counties were similar in respect to certain selected measurements such as: median and mean size of family, median age of household head and homemaker, median school grades completed by household head and homemaker, median net cash family income, and median Sewell socio-economic status score.[2]

USE OF PRIVATE MEDICAL SERVICES BY FAMILIES AND INDIVIDUALS

The families were queried as to whether any member had received care rendered by a general physician, dentist, hospital, medical specialist or other type of medical attendant during the year October, 1948–September 30, 1949. Eighty-seven per cent of the Cortland County families and 91 per cent of the Oswego County families had made use of the services of a general physician. Twenty-nine per cent of the Cortland and 25 per cent of the Oswego families had had hospital care. Only 8 per cent in Cortland and 4 per cent in Oswego received no medical care.

Data were compiled on the use of these same services by the individual members of the families. Fifty-four per cent of the family members in Cortland and 62 per cent of the family members in Oswego had a general physician. Thirty per cent of the family members in Cortland and 35 per cent in Oswego received dental care. Thirty-two per cent of the family members in Cortland sought no medical advice of a private nature and 24 per cent of those members in Oswego had no medical care. "The general over-all similarity in the pattern of use for the

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[2] The authors gave no explanation of the Sewell socio-economic status score, but investigation disclosed the following information. The Sewall socio-economic status score is a value derived from a standardized test which measures rural families on certain indices of socio-economic status, such as: condition of home, possession of material goods, and participation in community activities. The test was devised by William H. Sewell of Oklahoma Agricultural and Mechanical College.

two counties carries over into the record for individual family members despite some statistically significant differences."

USE OF PUBLIC HEALTH SERVICES

The proportion of families in both counties receiving some kind of public health service during the year under examination was 56 per cent of the families in Cortland and 50 per cent in Oswego. The proportion of individuals in Cortland was 35 per cent and 31 per cent in Oswego.

When broken down by type of service, more Cortland individuals made use of public health nurses, school nurses, and clinics, other than chest x-ray, than did Oswego persons. The proportion in Cortland using a public health nurse was 9 per cent; school nurses, 4 per cent; and clinics, 7 per cent. None of the Oswego persons used a public health nurse, nor a school nurse, and only 0.5 per cent visited a clinic.

On the other hand, Oswego had a better record of proportion of persons attending a chest x-ray clinic. Twenty-one per cent of the persons aged 15 and over made use of chest x-ray clinics in Oswego and 17 per cent did so in Cortland. It might be stated here that Oswego County had a nurse who specialized in tuberculosis work.

The proportion of children aged 1 to 14 years of age who had a record of vaccination or immunization against four specific diseases was shown. The proportion of children in Cortland County who were vaccinated against smallpox, 61 per cent, and immunized against diphtheria, 78 per cent, and tetanus, 63 per cent, was higher in each instance than the proportion in Oswego County which was 50 per cent for smallpox, 60 per cent for diptheria and 26 per cent for tetanus. The proportion vaccinated against whooping cough was the same in the two counties, 51 per cent.

SOURCES OF INFORMATION ABOUT HEALTH PRACTICES

An important consideration in determining health education methods is what sources of information for medical advice do the families already use. Ninety-two per cent of the families in Cortland County and 84 per cent in Oswego rely on the family doctor as one of their sources of information. Other sources

were magazine articles, 44 per cent in Cortland and 26 per cent in Oswego; books, bulletins and meetings, 33 per cent and 30 per cent; radio, 31 per cent and 12 per cent; public health workers, 27 per cent and 5 per cent. When queried as to what source was considered most dependable 83 per cent in Cortland and 74 per cent in Oswego said the family doctor.

The data which have been presented by the authors are most interesting and add valuable information to the field of the practice of medicine in rural areas.

Doris Tucher

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MATERNAL CARE AND MENTAL HEALTH[1]

In 1948, at the third session of the Social Commission of the United Nations, the decision was made to undertake a study of the needs of homeless children. The study was confined to "children who were homeless in their native country," that is, children separated from their families or orphans who were in need of care in institutions or foster homes. Refugees from war were not included in this analysis.

The World Health Organization offered to investigate the mental health aspects of the problem and appointed Dr. John Bowlby, consultant in mental health for WHO and Director of the Child Guidance Department of the Tavistock Clinic, London, to prepare the report. Dr. Bowlby visited France, the Netherlands, Sweden, Switzerland, the United Kingdom, and the U.S.A., where he collected material and had discussions with child-care and child-guidance workers. The results are presented in the volume MATERNAL CARE AND MENTAL HEALTH.

The first part of the book deals with the adverse effects of maternal deprivation, while part two is chiefly concerned with the prevention of this kind of deprivation.

One of the most significant contributions made by psychiatry in past years is the concept that a child's future mental health

[1] Bowlby, John: MATERNAL CARE AND MENTAL HEALTH. *World Health Organization*, Monograph Series No. 2, Palais des Nations, Geneva, 1951, 180 pp., 21 Tables. $2.00.

is dependent upon the quality of parental care he receives in his early years. For mental well-being, it is essential that the infant and young child experience an intimate and warm relationship with his mother. Given such a relationship, the child will be adequately equipped to deal with the emotions of anxiety and guilt which undoubtedly will arise in the course of his life.

Maternal deprivation refers to the situation in which a child finds himself when a rich and rewarding relationship with the mother is absent. Deprivation produces adverse effects which vary with the degree of deprivation that exists. The results of partial deprivation are excessive need for love, anxiety, guilt, and depression. Complete deprivation with which Dr. Bowlby's report is mainly concerned, has even more shattering effects on the infant's or child's character development and may completely hinder his capacity to form lasting, meaningful, human relationships.

The author presents a review of several studies on the effects of deprivation. These investigations of the mental health and development of children in institutions, foster homes, and hospitals were done by people of different countries, and the extent to which they confirm and corroborate each other is extremely impressive. The conclusions reached by these investigators is that ". . . when deprived of maternal care, the child's development is almost always retarded—physically, intellectually and socially—and that symptoms of physical and mental illness may appear."

Follow-up studies made in the late 1930's reveal that children who were guilty of committing numerous delinquencies and who appeared to be totally devoid of feelings for anyone, were found to have experienced grossly disturbed relationships with their mothers in the early years of their lives.

Some typical features of children who have had an adverse mother-child relationship, or who are in institutions, are: no capacity to care for people, lack of normal emotional responses, a curious lack of concern about everything, inaccessibility, deceit, evasion, and stealing. Bowlby finds that prolonged breaks in the relationship of mother to child are harmful because the development of libidinal ties with adults and other

children fails to occur. Both Bender and Bowlby feel that there is a definite connection between long periods of deprivation in early life and the subsequent development of an affectionless, psychopathic character.

The magnitude of the problem of treating homeless children, or adults who as children were deprived of maternal affection, is therefore apparent. Because of the almost complete inability of these individuals to make relationships, the psychotherapist finds himself robbed of his cardinal therapeutic tool. For as yet, no therapist has devised a method of dealing with a patient who has no feelings towards him at all.

It is clear that the most practical solution of such a problem would be to arrange methods of care for infants and young children which will prevent these conditions from ever developing.

Part II of this report is concerned with the prevention of maternal deprivation. First and foremost in the prevention of maternal deprivation is the preservation of the family. The affection which the young child needs can be easily provided within a family group while it is extremely difficult to obtain such continuous and unreserved care outside of the home. Even bad or neglectful parents inadvertently provide much for their children, for unless there is total rejection, a child realizes that there will always be someone that he can turn to in times of stress. This is why children are happier and thrive better in bad homes than in good institutions.

In a study made by Theis, it was found that one-third of the children who spent five years or more in institutions turned out to be socially incapable in adult life. It is almost certain that these adults were equally incapable as parents. Thus, children who suffer neglect and deprivation grow up and become parents who are lacking in the capacity to care for their own children. The author is quite aware that this vicious circle is, without doubt, the most serious aspect of the problem.

The author then presents a review of the causes of family failure in Western communities, making special reference to psychiatric factors. The dependency of family life on the economic, social, and medical forces within a given social system is stressed.

To prevent family failure, measures of active assistance such as socio-economic and socio-medical, must be taken. Bowlby feels that under no circumstances should a child be removed from competent parental care when the granting of direct economic assistance would make such a removal totally unnecessary. Governments and voluntary agencies should make every effort to allocate funds for the care of children in their own homes. Long-term community programs, such as increased and adequate family allowances, personal health services, and psychiatric care of individual families, should be set into motion as quickly as possible. Such a program, aimed at the prevention of family failure not only demands great effort but will also require the services of large numbers of skilled workers. Widely extended professional training and retraining is the primary need today in the field of mental hygiene, the ultimate goal being the preservation of the family. Dr. Bowlby also discusses the measures to be taken when it is found that a child must be removed from his home. Adoption, boarding homes, and group care are dealt with. Special emphasis is laid upon the psychological techniques to be employed depending upon the type of substitute family the deprived child is to enter.

Throughout this excellent report, the author stresses the primary significance of maternal care for the preservation of mental health. Although it is by no means clear why some children are so adversely affected by maternal deprivation and some are not, when all the evidence is gathered together it is remarkably self-consistent, and leaves little doubt that Dr. Bowlby's main proposition is valid. It is apparent that deprived children are as great a source of social infection as are carriers of typhoid and diphtheria. It is to be hoped ". . . that all over the world men and women in public life will recognize the relation of mental health to maternal care, and will seize their opportunities for promoting courageous and far-reaching reforms." In the last analysis, the credit must be given to Freud whose principles and theories underlie most of this volume and who discovered that human nature can overcome the most distressing facts and appalling calamities if it is helped to face the truth squarely.

KATHERINE SIMON

SOCIAL SECURITY[1]

I N THE past five years the International Labour Organisation has given attention to the development of social security plans in different countries. Programs for the Near and Middle East are considered in a report on SOCIAL SECURITY prepared for a regional conference to be held in Teheran in 1951. A detailed description of existing measures in individual countries and a good general discussion of possible future programs are included in the report. Highlights of the situation found in the region are given in the following paragraphs.

Present social security measures are limited in scope. Existing legislation is confined chiefly to provision for compensation of factory workers for injuries suffered while employed. Labor codes, public health services, provident funds, and voluntary schemes also furnish some protection.

Social security needs are great. Most of the inhabitants "urgently require" improved medical services. Agricultural peasants or small farmers need protection against certain risks, such as permanent incapacity approaching total disability, death of the head of the family, and business risks due to natural hazards which may cause loss of crops or livestock, or economic hazards in the form of price instability. Employed persons need protection against contingencies commonly resulting in loss of income, such as illness, death, old age, and unemployment.

The social and economic conditions present difficulties for development of social security programs under which groups of employed persons contribute part of their earnings for coverage. From 70 to 95 per cent of the inhabitants in nearly every country depend on agriculture for a living. Produce of the land is often consumed at home and not sold for cash. Industrial production is conducted primarily in small establishments with few employees. Productivity and income per worker are generally low. In many countries an unstable currency and a weak system of tax administration complicate the fiscal situation.

The very limited supply of medical personnel and hospitals in

[1] International Labour Organisation, Regional Conference for the Near and Middle East, Teheran, 1951, Report III, SOCIAL SECURITY. International Labour Office, Geneva, 1950. 69 pages, $.50.

countries other than Israel, Greece, and Lebanon creates special problems for medical care programs. There is one physician for approximately 1,060 persons in Greece, 4,300 persons in Egypt, and 8,900 persons in Iraq. The estimated average number of hospital beds per 1,000 persons is 3.5 in Greece, 1.6 in Egypt, and 0.3 in Iran.

Development of more complete social security plans is strongly recommended in spite of the difficulties. Immediate adoption of medical service programs, probably publicly financed, is proposed. Early action to furnish income security through compulsory social insurance is suggested. Priority in provision for short term risks of accident, sickness, and maternity is indicated. The time for introduction of pension insurance will be influenced by the degree to which employment becomes stabilized. Recognition is given to the fact that compulsory social insurance can probably be extended only gradually to different population groups.

Alternative measures are suggested for persons not covered by social insurance. Proposals include compulsory provident funds or plant sickness funds for urban workers, public assistance programs for both the urban and rural population, and cooperatives furnishing mutual insurance for interruptions in peasant income.

An outstanding impression left by the report is the great difference between conditions in the Near and Middle East and those in countries where social security programs have been most highly developed. The question arises, however, as to whether the implications of this difference are given due importance in the types of proposals made. Perhaps new approaches to the social security problem which do not follow the established pattern of social insurance are needed. For example, greater emphasis on provision of goods and services rather than cash income to sick, unemployed, or old persons may be desirable.

ELIZABETH JACKSON COULTER

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